# THE NEREIDIDAE OF SOUTH AUSTRALIA

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**Summary**

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Eleven new species of nereid polychaetes from South Australia are described: *Ceratonereis amphidonta* n.sp., *C. pseudoerythraeensis* n.sp., *C. transversa* n.sp., *Namanereis littoralis* n.sp., *Neanthes biseriata* n.sp., *N. isolata* n.sp., *N. uniseriata* n.sp., *Nereis bifida* n.sp., *N. cirriseta* n.sp., *N. spinigera* n.sp., and *N. triangularis* n.sp. Two additional new species, *Nereis maxillodentata* n.sp. and *N. parabifida* n.sp. are described from New South Wales. *Nereis heterissonensis* and *N. jacksoni* are redescribed. Diagnostic descriptions are given of known species of nereids occurring intertidally in South Australia. A key is provided.

KEY WORDS: Taxonomy, nereid polychaetes, South Australia.

## Introduction

In 1979, one of us (PH) made extensive collections of South Australian polychaetes, concentrating on estuarine and intertidal habitats. This paper is largely based on that material and is the first of a series describing the polychaete fauna of South Australia. Although the Australian nereid fauna was described by Hartman (1954) using largely South Australian material, we found 13 previously undescribed species.

In addition to describing the new species and redescribing two previously confused species, we have included a short diagnostic account of each genus (after Fauchald 1977a) and of previously described species. We stress, however, that many more nereids may occur subtidally. Species identified from the key should be checked carefully against the descriptions, in particular the notopodial homogomph falcigers of *Nereis* species and the paragnath patterns of *Neanthes* species. This is particularly important for non-South Australian material.

## Materials and Methods

The locality data for the bulk of the material examined has been coded and tabulated (Table 1). The codes have been used in the Material Examined section of each species description. Registration numbers of Australian Museum material have been abbreviated to numbers only. Paratypes have been deposited whenever possible at the Allan Hancock Foundation, Los Angeles (AHF), British Museum (Natural History), London (BMNH), and the National Museum of Natural History Smithsonian Institution, Washington D.C. (USNM). Other abbreviations used are as follows: HZM, Zoologisches Institut und Zoologisches Museum der Universität Hamburg; MNHN, Muséum National d'Histoire Naturelle, Paris; SSM, Naturhistoriska Rijksmuseet, Stockholm; WAM, Western Australian Museum, Perth.

The Australian distribution of each species has been summarised by State using Day & Hutchings (1979) checklist. Additional locality data from Hartmann-Schröder (1979, 1980, 1981), Hutchings & Rainer (1979) and Saenger *et al.* (1980) are given in parentheses.

In general, we have only cited major Australian references. Full Australian synonymies are given by Day & Hutchings (1979).

Some species of *Neanthes* closely resemble *Perinereis* species which lack solid bars on Area VI of the pharynx. In our material, apart from *Neanthes cricognatha*, *N. kerguelensis*, and *N. vaalii* we have described three new species of *Neanthes* which fall into this group. Also, the diagnosis of *Ceratonereis* specifies the presence of notopodial homogomph falcigers, although these are absent in many species including the three new species described in this paper. Further, *Nereis* is partly identified by paragnaths in both oral and maxillary rings. *Nereis maxillodentata* n.sp. lacks oral paragnaths and possesses notopodial falcigers. Hence it should be placed in *Ceratonereis*, although its affinities are clearly with *N. bifida* n.sp., and it has been placed in *Nereis* for that reason. We suggest, therefore, that the above nereid genera require careful re-evaluation, although this is beyond the scope of the present study.

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TABLE 1. *Synopsis of collection data.*

| Locality, collector & date | Lat./Long. (deg., min.) | Habitat | Code |
|---|---|---|---|
| Port Augusta, Hutchings 14/3/79 | 32–30/137–46 | Sand on mudflats in front of mangroves, under bridge | 01A |
| Streaky Bay, near caravan park, Hutchings 13/3/79 | 32–48/134–13 | Mussel clumps at mid-tide level on mud flats | 02A |
| | | Mud flats, *Posidonia* | 02B |
| | | Mud sievings, *Posidonia* | 02C |
| | | *Posidonia* and *Zostera* seivings | 02D |
| Streaky Bay, little island on outer margin of inner bay, Hutchings 13/3/79 | 32–48/134–13 | Fauna associated with *Zostera* | 03A |
| | | Sand sievings | 03B |
| | | Sand sievings, *Posidonia* | 03C |
| | | Under boulders | 03D |
| Speeds Point, Streaky Bay, Hutchings 14/3/79 | 32–48/134–13 | Algal washings | 04A |
| | | *Zostera* sievings | 04B |
| Port Kenny, Venus Bay, Hutchings 12/3/79 | 33–10/134–41 | Mussel clumps at mid-tide level | 05A |
| Venus Bay, village, Hutchings 12/3/79 | 33–14/134–40 | Algal mat on reef south of village | 06A |
| | | Sand sievings | 06B |
| | | Fauna on jetty piles | 06C |
| Elliston, reef at southern end of town, Hutchings 12/3/79 | 33–39/134–53 | Under rocks on low tide reef flat | 07A |
| | | Algae from low tide reef flat | 07B |
| Elliston, reef just past post office, Hutchings 12/3/79 | 33–39/134–53 | Algal washings | 08A |
| Elliston, jetty, Hutchings 12/3/79 | 33–39/134–53 | Amongst *Galeolaria* on jetty piles | 09A |
| | | Nearby rocks, encrusting algae | 09B |
| Kellidie Bay, Hutchings 11/3/79 | 34–36/135–29 | Mussel clumps at mid-tide level | 10A |
| | | *Zostera* and sand sievings | 10B |
| Porter Bay, Port Lincoln, near boat ramp, Hutchings 10/3/79 | 34–44/135–53 | *Zostera* sievings | 11A |
| Torrens Island, Adelaide Power Station, Hutchings 7/3/79 | 34–47/138–32 | Mud flats in front of thermal effluent (up to 42°C) | 12A |
| | | Mud flats in front of mangroves | 12B |
| | | Mud flats in front of mangroves with patchy *Zostera* | 12C |
| Flinders Cairn, Hutchings 10/3/79 | 34–49/135–47 | Sand at low tide level | 13A |
| | | Mussel clumps at mid-tide level | 13B |
| Sleaford Mere, Hutchings 10/3/79 | 34–50/135–45 | Mud, salinity 0‰ | 14A |
| Sleaford Bay, Hutchings 10/3/79 | 34–54/135–47 | Algae on ocean side of bay | 15A |
| Sellicks Beach, reef to north, Hutchings 16/3/79 | 35–20/138–27 | Algal washings | 16A |
| | | Sievings in *Cymodocea* | 16B |
| Rapid Bay, jetty between Normanville and Second Valley, Hutchings 8/3/79 | 35–32/138–11 | Fauna attached to jetty piles | 17A |
| Victor Harbor, just behind bluff, Hutchings 16/3/79 | 35–33/138–38 | Crevice fauna | 18A |
| Emu Bay, Kangaroo Island, adjacent to old jetty, Hutchings 1/3/79 | 35–35/137–31 | Corulline algae washings | 19A |
| | | Crevice fauna | 19B |
| | | Algal washings | 19C |
| | | Under rocks beside jetty | 19D |
| Stokes Bay, Kangaroo Island, Hutchings and Butler 5/3/79 | 35–37/137–12 | Algal washings | 20A |
| Stokes Bay, Kangaroo Island, Handley 4/3/78 | 35–37/137–12 | Algae at low tide level | 21A |
| Bay of Shoals, Kangaroo Island, Hutchings and Edmonds 1/3/79 | 35–38/137–37 | *Zostera* sievings | 22A |
| 3 km S.W. of Cape Rouge, Kangaroo Island, Handley 7/3/78 | | Sand flats verging into *Posidonia* and *Hormosira* | 22B |
| Bay of Shoals, low tide, Hoese, March, 1978 | | *Posidonia*, *Zostera*, mud and sand | 22C |
| Snellings Beach, mouth of Middle River, Kangaroo Island, Hutchings and Butler 5/3/79 | 35–42/137–06 | Algal holdfasts and crevice fauna | 23A |
| Penneshaw jetty, Kangaroo Island, Handley 9/3/78 | 35–43/137–56 | In sponges on boom piles at 5m, and under rocks | 24A |
| Western River Cove, Kangaroo Island, Handley 3/3/78 | 35–43/136–56 | Sheltered rock pool, under rocks and algae | 25A |

| Locality, collector & date | Lat./Long. (deg., min.) | Habitat | Code |
|---|---|---|---|
| Redbanks, Nepean River, Kangaroo Island, Loch and Yoo 8/3/78 | 35–44/137–43 | Sheltered shallow bay at low tide | 26A |
| Maston Point, American River, Kangaroo Island, old wharf, Hutchings 2/3/79 | 35–47/137–46 | Clumps of sponge at 5 m in fast-flowing channel with many *Pinna* | 27A |
| | | Sand, sponges, and sandy conglomerate rock at 5 m in fast-flowing channel | 27B |
| | | *Zostera* sievings | 27C |
| | | *Posidonia* sievings | 27D |
| American River, Kangaroo Island, top of river just below turn-off to Pennington Bay Hutchings 3/3/79 | 35–47/137–46 | Surface detritus and algae | 28A |
| Pelican Lagoon, south side Kangaroo Island, Handley 8/3/78 | 35–50/137–45 | Under rocks and *Hormosira* in front of salt marsh, at mid-tide level | 29A |
| Cape du Couedic, Kangaroo Island, Hutchings and Butler 4/3/79 | 36–03/136–41 | Exposed beach algal holdfasts | 30A |
| | | Exposed beach, coralline algae on algal holdfasts | 30B |
| | | Exposed beach, coralline algae washings | 30C |
| | | Exposed reef, algal holdfasts | 30D |
| | | Exposed reef, coralline algae | 30E |
| Harriet River estuary, Vivonne Bay, Kangaroo Island. Yoo and Handley 2/3/78 | 35–58/137–09 | Sievings at low tide level | 31A |
| Hanson Bay, Kangaroo Island Hutchings and Butler 4/3/79 | 36–02/136–51 | Algal holdfasts on reef flat | 32A |
| South West River, Handley and Hoese 6/3/78 | 36–00/136–52 | Sandy with some algae, scoop net and sieve | 32C |
| Cape Domby, near obelisk. Yoo 28/2/78 | 37–10/139–44 | Algae from pool on exposed rock platform | 33A |
| Cape Northumberland, on west side. Yoo, Loch and Handley 27/2/78 | 38–04/140–40 | Sheltered pools behind exposed rock platform at low tide | 34A |

The value of paragnath counts based on a small number of specimens is also questionable, although differences in paragnath patterns and large differences in approximate numbers appear to be useful. In this study we have had the opportunity in most cases of examining a large amount of material from a variety of habitats. It is clearly apparent that considerable variation in paragnath counts occurs within most species, with smaller individuals often having fewer paragnaths than larger ones. We have thus attempted to give approximate ranges of paragnath counts for all the material examined and described the patterns of paragnath distribution as accurately as possible.

*Nereis denhamensis* Augener, 1913 and *N. heirissonensis* Augener, 1913 were synonymised with *N. jacksoni* Kinberg, 1866 by Augener (1924: 319). We have examined the type material of all these species plus material identified by Augener (1927), Hartman (1954) and Kott (1951). We found all three species to be valid and *N. jacksoni* appears to be restricted to the single specimen identified by Kinberg, from Port Jackson, N.S.W. A search of the Australian Museum's extensive collections from this area failed to reveal any additional specimens. Other material identified as *N. denhamensis*, *N. heirissonensis* and *N. jacksoni* we found to include four new species, *N. bifida* n.sp., *N. cirriseta* n.sp., *N. maxillodentata* n.sp. and *N. parabifida* n.sp.

**Key to South Australian Nereididae**

1. Peristomium without frontal antennae, palps without palpostyles . . *Micronereis halei*
   Peristomium with frontal antennae, palps with palpostyles 2
2. Pharynx without chitinous paragnaths . . 3
   Pharynx with chitinous paragnaths (sometimes difficult to see in small individuals) . . 5
3. Ventrum of anterior setigers (7–30) with rows of papillae *Australonereis ehlersi*
   Ventrum of anterior setigers smooth 4
4. Pharynx with fleshy cirriform papillae; notopodial lobes developed . . *Olganereis edmondsi*
   Pharynx without papillae, notopodial lobes absent *Namanereis littoralis* n.sp.

5. Paragnaths all pectinate rows with many minute fused points *Platynereis dumerilii antipoda*
Paragnaths not as above 6
6. Paragnaths in Areas II, III and IV as individual, flattened, pointed cones in more or less regular, comb-like rows, notopodia with homogomph falcigers. *Pseudonereis anomala*
Paragnaths in Areas II, III and IV otherwise, notopodia with or without homogomph falcigers 7
7. Notopodia posteriorly with homogomph falcigers 8
Notopodia without homogomph falcigers 18
8. Prostomium deeply divided between antennae *Ceratonereis mirabilis*
Prostomium not as above 9
9. Pale, slender notopodial homogomph falcigers present from setiger 3 *Nereis cockburnensis*
Notopodial homogomph falcigers appearing later 10
10. Areas VII and VIII with 100–200 cones in a broad continuous band *Nereis triangularis* n.sp.
Areas VII and VIII otherwise 11
11. Neuropodial heterogomph falcigers normally in both supra- and subacicular fascicles 12
Neuropodial heterogomph falcigers replaced entirely by heterogomph spinigers in many anterior parapodia *Nereis spinigera* n.sp.
12. Notopodial homogomph falcigers with one large lateral tooth subequal with terminal tooth, variable numbers of much smaller teeth basally 13
Notopodial homogomph falcigers with lateral teeth much smaller than terminal tooth or if similar in size, then more than one large lateral tooth or terminal tooth obviously worn 15
13. Area III of pharynx with transverse row of cones 14
Area III of pharynx bare, rarely with a single cone *Nereis bifida* n.sp.
14. Oral ring of pharynx bare *Nereis maxillodentata* n.sp.
Oral ring of pharynx with paragnaths *Nereis parabifida* n.sp.
15. Area VI of pharynx with paragnaths 16
Area VI of pharynx bare *Nereis heirissonensis*
16. Areas VII–VIII of pharynx with narrow band of about 40–45 paragnaths (many may be difficult to see) *Nereis jacksoni*
Areas VII–VIII of pharynx with less than about 20 paragnaths 17
17. Area I of pharynx bare, Area III bare or rarely with a single small paragnath *Nereis cirriseta* n.sp.
Area I of pharynx generally with paragnaths, Area III with 1 to about 24 paragnaths *Nereis denhamensis*
18. Middle and posterior neuropodia with giant simple falcigers above aciculum 19
Simple falcigers absent 21
19. Area III without paragnaths *Ceratonereis transversa* n.sp.
Area III with paragnaths 20
20. Anterior neuropodia with digitiform postsetal lobe *Ceratonereis amphidonta* n.sp.
Anterior neuropodia without digitiform postsetal lobe *Ceratonereis pseudoerythraeensis* n.sp.
21. Paragnaths in Area VI elongate transverse bars or a transverse series of short bars which may be pointed, but rectangular base 27
Paragnaths in VI conical, i.e. with circular base, or absent 22
22. Notopodia with three triangular lobes *Neanthes cricognatha*
Notopodia with two triangular or conical lobes, presetal if present only as rounded ridge on ventral lobe 23
23. Area I without paragnaths, VII–VIII maximum about 4 *Neanthes kerguelensis*
Area I with paragnaths, Areas VII–VIII with many 24
24. Area VI with one or more transverse lines of conical paragnaths; free part of ventral neuropodial lobe reduced to a small tubercle or conical flap by fusion with the acicular lobe in middle or posterior parapodia 25
Area VI with centrally isolated group of paragnaths; ventral neuropodial lobe remaining free posteriorly, sometimes slightly reduced relative to other lobes 26
25. Area VI with single transverse row of large paragnaths and occasional additional ones, VII–VIII with continuous band of mainly large cones, usually less than 50, with smaller cones scattered, rare or absent *Neanthes uniseriata* n.sp.
Area VI with row of larger cones in front of a variable row of smaller cones, VII–VIII with continuous band of cones, generally more than 50, including numerous small cones *Neanthes biseriata* n.sp.
26. Area V with three cones in a triangle, occasionally only two or with a few extra but not in a longitudinal series, Area IV more than about 20 *Neanthes vaalii*
Area V with 2 or more large cones in longitudinal series plus 0–3 smaller cones, IV with less than about 20 *Neanthes isolata* n.sp.
27. Paragnaths in VI numerous short, transverse bars in transverse series *Perinereis nuntia*
Paragnaths in VI single, long transverse bar *Perinereis umblyodonta*
Paragnaths in VI 2 elongate transverse bars in transverse series *Perinereis variodentata*

### *Australonereis* Hartman

Eversible pharynx with soft papillae on maxillary ring, oral ring bare. Four pairs of

tentacular cirri; biramous parapodia. Notosetae homogomph spinigers, neurosetae homo- and heterogomph falcigers. Fleshy transverse ridges across anterior ventrum.
Type species: *Australonereis ehlersi* (Augener)

*Australonereis ehlersi* (Augener)

*Australonereis ehlersi* Augener, 1913: 142–145, Pl. III, fig. 53u, text fig. 12a–c. Day & Hutchings, 1979: 105.

*Material Examined:* A selection of the material examined. W.A.—Leschenault Est., Bunbury (4340, 5615). S.A.—Onkaparinga Est., many (6061) coll. Shepherd. Coorong Lagoon, 4 (8426) coll. Shepherd. Kangaroo Island, Mary River (5374) coll. Hutchings. Vic.—Gippsland Lakes (5514) coll. Hight. Mallacoota (8439) coll. Hutchings. N.S.W.—Careel Bay (5282, 5287) coll. Hutchings. Wallis Lake (4211, 4213) coll. Paxton. Old.—Eli Creek, Hervey Bay (5373) coll. Hutchings.

*Description:* Angular flimsy sandy tubes. Pharynx lacking chitinous paragnaths. Oral ring smooth, maxillary ring with more than 50 short, cirrus-like papillae in 3–5 irregular rows. First 6 setigers with slender ventral cirrus on papillar elevations. Setigers 7–30 with additional papillae medial to base of ventral cirrus, reaching maximum of 6–7. Following setigers without such papillae.

Notosetae all spinigers, neurosetae, spinigers and falcigers. Blades of falcigers with single longitudinal series of denticles, terminating in curved process bounded by series of denticulations continuous from cutting edge.

*Comments:* This is the first record from South Australia, although it appears to be common elsewhere.

*Australian Distribution:* Western Australia, Victoria, New South Wales, Queensland.

*Habitat:* Sandy mud in estuarine or sheltered bays, often associated with seagrass beds.

*Ceratonereis* Kinberg

Pharynx eversible with conical paragnaths on maxillary ring only. Four pairs of tentacular cirri; biramous parapodia. Notosetae include homogomph spinigers and falcigers; neurosetae homo- and heterogomph spinigers and heterogomph falcigers. Dorsal cirri attached basally to superior notopodial lobe; inferior neuropodial lobe may be present.
Type species: *C. mirabilis* Kinberg

**Ceratonereis amphidonta** n.sp.

FIG. 1a–c

HOLOTYPE: S.A.—27D (18397) incomplete posteriorly, 103 setigers 42 mm length, 2.5 mm width.

*Description:* Body robust, flattened, tapering gradually posteriorly, colour in alcohol, dark purplish brown. Prostomium slightly longer than wide, with deep anteromedian groove. Two pairs of eyes, embedded, reddish purple in colour, lenses visible. One pair of stout palps with globular palpostyles. Four pairs tentacular cirri, longest extending to setiger 9. Pharynx partially everted, jaws short, stout, translucent brown with 5 teeth. Paragnaths restricted to maxillary ring, consisting of grey-brown, transparent, rounded cones (domes) and large, sharply pointed, elongate cones, opaque, orange to scarlet with grey-brown bases, arranged as follows: I = central patch of 9 domes and 2 large scarlet cones on either side; II = 8 in irregular oblique rows of brown domes; III = 19 in transverse band of 10 domes and 9 large scarlet cones; IV = 15–17 domes in triangular patch.

Dorsal cirrus in anterior setigers (Fig. 1a) extending to tip of dorsal notopodial lobe, posteriorly to just behind. Dorsal and ventral notopodial lobes conical, becoming more pointed posteriorly (Fig. 1a,b). Presetal notopodial lobe slightly produced as low ridge on base of ventral notopodial lobe in anterior

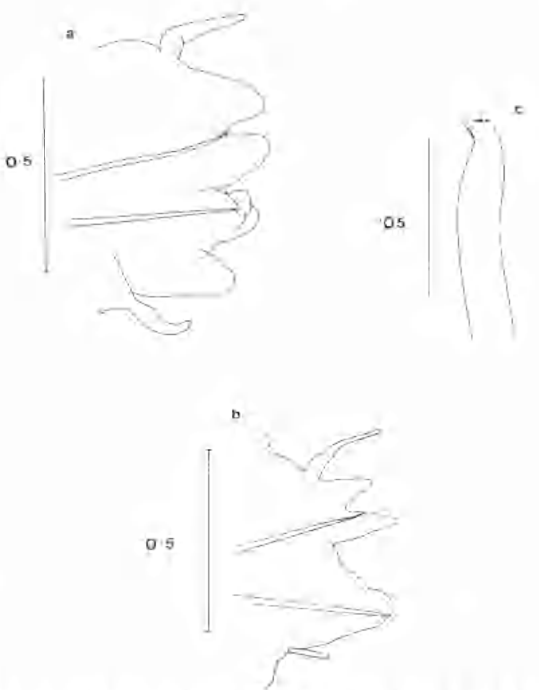


Fig. 1. *Ceratonereis amphidonta* n.sp. a, anterior view of 9th parapodium. b, anterior view of 99th parapodium. c, simple falciger, setiger 70. Scales in mm.

setigers (Fig. 1a), disappearing in middle setigers. Dorsal neuropodial lobe anteriorly shorter than ventral notopodial lobe but in setigers 1–18 bearing large, digitiform postsetal lobe extending posterolaterally, frequently to level of ventral neuropodial lobe. Dorsal neuropodial lobe elongating to level of or past ventral notopodial lobe in more posterior setigers. Ventral neuropodial lobe shorter, well-developed anteriorly but decreasing rapidly to disappear by middle setigers. Ventral cirrus reaching halfway to, or just to, tip of ventral neuropodial lobe anteriorly and half to two-thirds of way to point of emergence of most ventral neurosetae in later setigers. Acicula brown-black with pale tips. For numbers and type of setae see Table 3. Giant simple falcigers formed by gradual ankylosis of dorsal heterogomph falcigers over range of setigers 25–40, distally dark, strongly hooked with several small teeth above main fang, (Fig. 1c), fine tendon clearly visible only in lateral view. Compound setae typical.

*Discussion: Ceratonereis amphidonta* n.sp. resembles *C. erythraeensis* Fauvel, 1918 in the presence of simple neuropodial falcigers. It differs in the arrangement of paragnaths, in the disappearance of the ventral neuropodial lobe, and in the presence of a neuropodial postsetal lobe anteriorly. This group of *Ceratonereis* with simple setae seems to have radiated within southern Australia (see Discussion for *C. pseudoerythraeensis* n.sp.). *Ceratonereis amphidonta* n.sp. can be distinguished from *C. transversa* n.sp. by the presence of paragnaths on Area III of the pharynx and from *C. pseudoerythraeensis* n.sp. by the presence of digitiform postsetal lobes in anterior neuropodia. The name refers to the two types of paragnaths present.

TABLE 3. *Setal counts for* Ceratonereis amphidonta *n.sp.*

| | No. of setae | |
|---|---|---|
| | setiger 10 | setiger 101 |
| *Notosetae* | | |
| homogomph spinigers | 13 | 4 |
| *Neurosetae* | | |
| (i) Dorsal fascicle | | |
| above—homogomph spinigers | 7 | 3 |
| below—heterogomph spinigers | 5 | — |
| —giant simple falcigers | — | 2 |
| (ii) Ventral fascicle | | |
| above—heterogomph spinigers | 11 | 9 |
| below—heterogomph falcigers | 10 | 3 |

*Australian Distribution:* South Australia (Maston Point, Kangaroo Island).

*Habitat: Posidonia* seagrass beds.

*Ceratonereis mirabilis* Kinberg

*Ceratonereis mirabilis* Kinberg, 1866: 170. Hartman, 1954: 9, 13. Perkins, 1980: 4–11, figs. 1–4. Hartmann-Schröder, 1980: 58. For synonomies, see Day & Hutchings, 1979, and Perkins, 1980.

*Material Examined:* S.A.—03A, 1 spec. (18284). 19B, 1 (18286). 23A, 1 (18385). 24A, 2 (18289). 27B, 1 (18288). 27C, 1 (18287). Upper Spencer Gulf (5966, 5968, 18473) coll. Shepherd.

*Description:* Size range, 66 setigers, 16 mm length, 1.8 mm width, other material posteriorly incomplete, up to 5.7 mm width.

Tentacular cirri long, at least to setiger 13. Pharynx with conical paragnaths arranged as follows: I = 0; II = 8–15 in oblique oval patch; III = 7–16 in roughly circular patch; IV = 8–18 in circular patch; V–VIII completely absent. Parapodia strongly compressed, notopodial and ventral neuropodial lobes acutely conical, dorsal neuropodial lobe with digitiform presetal lobe. Dorsal cirri, three to four times length of dorsal notopodial lobe in anterior segments, extending to eight to ten times in posterior segments. Ventral cirri shorter, at longest extending slightly past ventral neuropodial lobe. Notosetae anteriorly homogomph spinigers with projecting flap on margin of socket, homogomph falcigers also present from middle setigers. Dorsal neurosetae homogomph spinigers and heterogomph falcigers, ventral neurosetae heterogomph spinigers and falcigers, occasionally heterogomph spinigers in dorsal fascicle.

*Comments:* The two individuals which have heterogomph spinigers in the dorsal fascicle also have far more elongate conical paragnaths than other material. They do not appear to belong to a separate species. Both specimens were living in association with sponges whereas the others were collected among algae, under rocks, or in seagrass beds.

*Australian Distribution:* Western Australia (Broome, Port Hedland, Onslow, Exmouth). South Australia, Victoria, New South Wales (Careel Bay) and Queensland.

*Habitat: Zostera* beds and associated with encrusting fauna.

**Ceratonereis pseudoerythraeensis** n.sp.

FIG. 2a–e

*Ceratonereis erythraeensis* Monro, 1938: 617–618. Kott, 1951: 108. Hutchings & Recher, 1974:

104, 115, 119. Hutchings & Rainer, 1979: 753. South Coast Report, 1981: 77, 123. Atkinson *et al.*, 1981: 318–321. *Non* Fauvel.

HOLOTYPE: S.A.—Onkaparinga Est. (18510) coll. Shepherd, 97 setigers, 53 mm length, 3.6 mm width. PARATYPES: S.A.—Onkaparinga Est. 2 spec. (AHF POLY 1348), 2 (BMNH ZB 1982: 1–2), 2 (USNM 071528), 9 (6060), 31A, 13 (18282), 32A, 24 (18279), 32A, 3 (18280), 32C, 33 (18281). Size range of paratypes 35 setigers, 5.3 mm length, 0.75 mm width to 91 setigers, 59 mm length, 3.9 mm width.

*Additional Material:* W.A.—Yunourup, South Bank of Mill Island, 2 (WAM 3–72) coll. Hart.

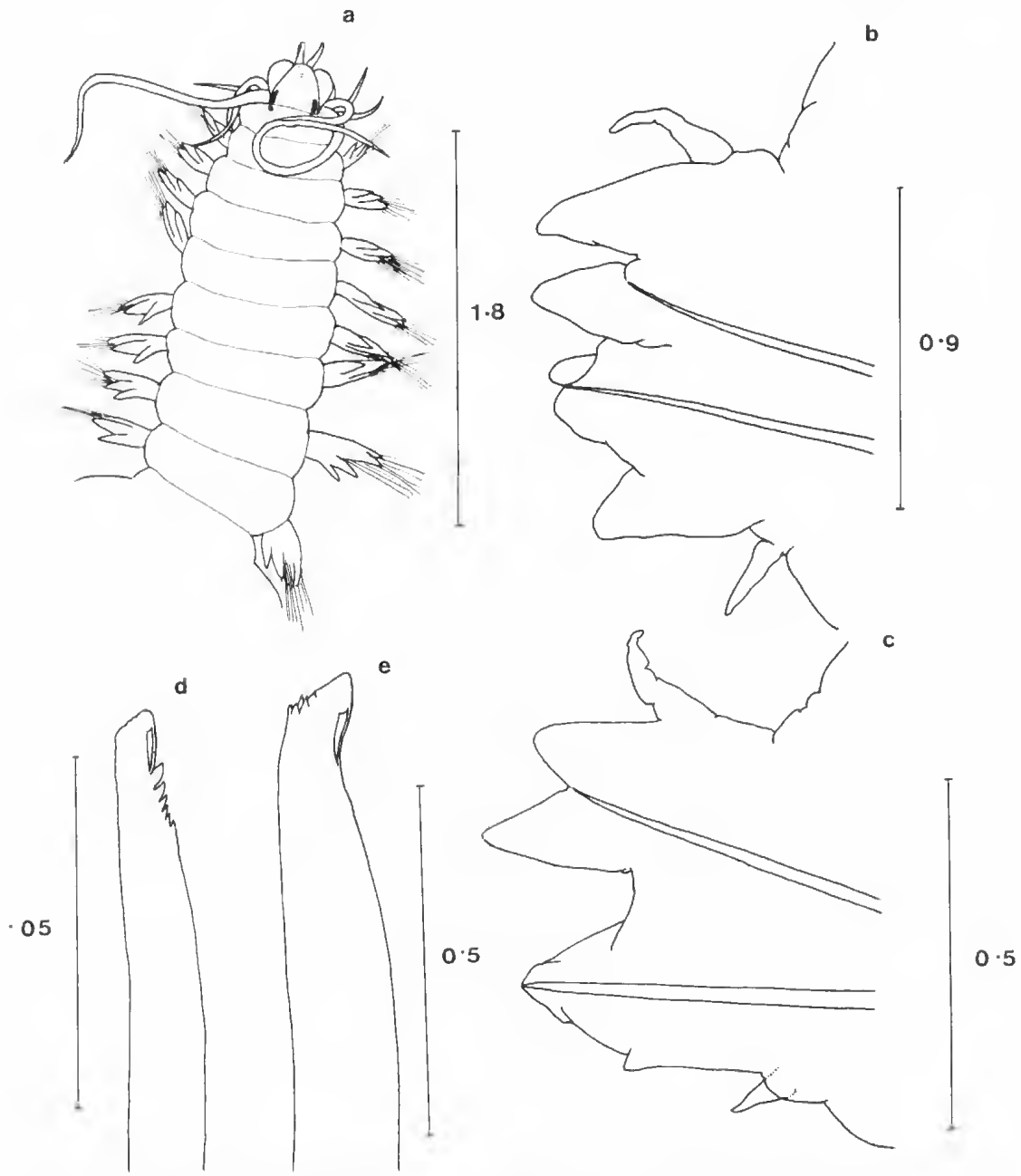


Fig. 2. *Ceratonereis pseudoerythraeensis* n.sp. a. anterior portion, dorsal view (Paratype ex 18282). b. anterior view of 6th parapodium c. anterior view of 78th parapodium. d. developing simple falciger from setiger 23. e. fully-developed simple falciger from setiger 80. Scales in mm.

Walpole Jetty, 2 ft, 2 (WAM 5-73) coll. Lenanton, Walpole Inlet, 9 (WAM 173-81) coll. Marine Science Camp 1973, Swan River, Rocky Bay to Guildford, in sand and mud, 57 (WAM 30-74) coll. Joll. Point Peron (6815) id. Kott. Lake Clifton (17261) coll. Terni. N.S.W.—Tuross R. (14971), Coila Lake (14967, 14974-6), Buckenbowra R. off Clyde R. (14969), Borang R. (14977) coll. S. Coast Survey Aust. Mus. 1974, Main Bar, Port Hacking, *Posidonia* (11207), Towra Beach, Botany Bay, *Posidonia* (10956) coll. N.S.W. State Fish. Careel Bay, salt marsh (5280), *Avicennia* (5278), mud flat (5279), *Zostera* (5261) coll. Hutchings. Darkum Lagoon, N. of Woolgoolga (17232) coll. Simpson.

*Other Material Examined: Ceratonereis erythraeensis*—Sénafir, island south of Suez Canal, Tadjoura Bay (Red Sea), Tuléar, Madagascar (WS190) and Dairen, Mandchouria, from MNHN, id. Fauvel, but not part of type series.

*Ceratonereis erythraeensis* Pelican, Swan River, West Australia (BMNH ZK 1938.10.31.11–18), 3 spec. pres. Serventy, id. Monro 1938.

*Ceratonereis vaipekae* Gibbs—Aitutaki, Cook Islands (BMNH ZB 19.72.1) Holotype

*Description:* Body flattened, tapering, robust anteriorly pale yellow-white in alcohol with brown, granular shading dorso-anteriorly. Prostomium length about equal to width with deep anteromedian groove (Fig. 2a). Eyes purple-black, anterior pair larger, lenses distinct. Palps small, stout, ventral length equal to first 2 setigers, palpostyles globose. One pair antennae extending to level with palps. Four pairs of tentacular cirri, longest extending to middle of setiger 7, shallowly, but distinctly annulated. Eversible pharynx with stout, curved jaws, transparent brown with 6 (left)–9 (right) teeth. Paragnaths brown cones, arranged as follows: I = 4 in irregular longitudinal group; II = 21 (right)–27 (left) in oblique band; III = 32 in broad transverse band; IV = 39 in transverse Y-shaped band with one arm of Y towards jaws; oral ring bare.

Dorsal cirrus about 0.2 times length of dorsal notopodial lobe anteriorly, retaining similar length relative to other lobes along length of body. Notopodial lobes conical becoming more pointed posteriorly, dorsal and ventral similar in size except in far posterior where dorsal notopodial lobe decreases to become absent in last few setigers. Presetal notopodial lobe small, rounded on dorsal base of ventral notopodial lobe in anterior setigers (Fig. 2b), decreasing in size posteriorly (Fig. 2c). Neuropodial lobes becoming widely separated from notopodial lobes in late anterior setigers. Dorsal neuropodial lobe extending approximately as far as notopodial lobes anteriorly, becoming relatively shorter posteriorly. Ventral neuropodial lobe conical and well-developed in far anterior setigers, reducing from about setiger 6 to a small tubercle by about setiger 25 then remaining as such. Dorsal neuropodial lobe without well-developed pre- or postsetal lobes. Ventral cirrus extending one-third to halfway to tip of ventral neuropodial lobe. Acicular black, brown at extremities. For numbers and types of setae see Table 4. Heterogomph falcigers pale, shafts slightly thicker than spinigers, appendages slender, finely toothed along most of margin, weakly hooked with indistinct tendon. Giant simple falcigers formed by ankylosis and rearrangement of teeth of heterogomph falcigers in dorsal neuropodial fascicle over about setigers 20–30 (Fig. 2d, e). Dorsal neurofalcigers in this region with intermediate characteristics. Fully formed giant simple falcigers very thick, dark brown, distally strongly hooked with bluntly conical main fang surmounted by transverse band of several small teeth, tendon distinct.

Anal cirri extend over last 2 setigers.

*Comments:* Variations not described for holotype include peristomium length 1.3–1.5 times width. Palp length equal to first 1.5–2 setigers ventrally. Antennae extending to level with or well past palps. Both antennae and tentacular

TABLE 4. *Setal counts for holotype of* Ceratonereis pseudoerythraeensis *n.sp.*

| | No. of setae | | |
|---|---|---|---|
| | Setiger 11 | Setiger 47 | Setiger 80 |
| *Notosetae* | | | |
| homogomph spinigers | 18 | 6 | 5 |
| *Neurosetae* | | | |
| (i) Dorsal fascicle | | | |
| above—homogomph spinigers | 9 | 4 | 3 |
| below—heterogomph falcigers | 3 | — | — |
| —giant simple falcigers | — | 1 | 1 |
| (ii) Ventral fascicle | | | |
| above—heterogomph spinigers | 20 | 6 | 8 |
| below—heterogomph falcigers | — | 6 | 1 |

Parapodia before about setiger 14 without heterogomph falcigers in ventral neuropodial fascicle.

cirri shallowly, distinctly annulated, longest tentacular cirri extending to setiger 5–9. Paragnaths with I — 1–4, may not be visible in very small specimens; II — 10–36 in oblique band sometimes divided towards jaws; III 17–45 in narrow to broad transverse band; IV — 12–53 in V- or Y-shaped band. Paragnaths in I and III may be barely visible in small specimens. Dorsal cirrus extending two-thirds of the way to or just reaching tip of dorsal notopodial lobe in anterior setigers, posteriorly remaining similar or elongating to two or three times length of dorsal notopodial lobe before latter decreases. Relative lengths of dorsal and ventral notopodial and dorsal neuropodial lobes on average similar anteriorly, dorsal neuropodial lobe frequently shorter posteriorly. Ventral neuropodial lobe decreasing to small tubercle by middle setigers. Numbers of setae at about setiger 10 and in middle and posterior setigers respectively as follows: notosetae 3–18, 1–7, 1–4 homogomph spinigers; neurosetae dorsally 3–13, 1–10, 2–5 homogomph spinigers above and below 1–4 heterogomph falcigers followed later by 1, 1 (rarely 2) giant simple falcigers; ventrally 1–18, 1–6, 1–5 heterogomph spinigers above and 2–6, 1–10, 1–5 heterogomph falcigers below. Setae of any type and position occasionally missing. Occasional specimens lacking heterogomph falcigers in dorsal, ventral or both neuropodial fascicles of some anterior parapodia. Falcigers in dorsal neuropodial fascicle all heterogomph in far anterior setigers, developing into giant simple falcigers by middle setigers. The numbers of paragnaths and setae generally increase with size of specimen. Larger specimens than in the paratype series with higher paragnath counts, e.g. specimens from Swan River about 80 mm in length (WAM 70–34) with 9–12 paragnaths in Area I.

*Discussion: Ceratonereis erythraeensis* Fauvel has been reported widely from around Australia. Closer examination of this material revealed certain differences from Fauvel's (1918) description of the species. Fauvel described this species again as a new species in 1919, from the same locality which is rather confusing. The Muséum National d'Histoire Naturelle, Paris, is unwilling to lend type material, although we were able to borrow material identified by Fauvel as *C. erythraeensis*. This material agrees with Fauvel's descriptions and figures except that the material has a slightly reduced ventral neuropodial lobe compared to that figured by Fauvel. The material from Boui de Tadjoura is in an advanced state of epitoky. The material from Australia differs in the paragnath pattern, in the shape and dentition of the simple setae, and in the strong reduction of the ventral neuropodial lobe.

There are suggestions in the literature (Monro, 1938 and as cited in Kott 1951; Hartman 1959) that *C. erythraeensis* Fauvel, 1918 is synonymous with *C. aequisetis* (Augener, 1913) and that Augener overlooked the presence of the simple setae. The simple setae are very conspicuous and we do not believe that Augener could have overlooked them. Augener's species also lacks heterogomph falcigers except in far posterior setigers, whereas these are present in *C. erythraeensis* and *C. pseudoerythraeensis* n.sp. There thus appears to be two species of *Ceratonereis* in Swan River, the type-locality of *C. aequisetis* and the site of Monro's material. Monro figures a dentate simple seta which closely resembles *C. pseudoerythraeensis* n.sp. We examined Monro's material and it is identical to *C. pseudoerythraeensis* n.sp. Examination of Kott's material (6815) revealed that, contrary to her description, neuropodial falcigers are generally present anteriorly and the simple setae are dentate as in *C. pseudoerythraeensis* n.sp. Kott removed the pharynges on her three specimens so we cannot confirm the paragnath counts. Additional material from southwest W.A., including the Swan River, is also *C. pseudoerythraeensis* n.sp.

We have had access to a very large range of material (not all listed in 'Materials Examined' section) and have seen no evidence of epitokal modifications similar to those in Fauvel's material. In contrast, several mature worms have been found in flimsy sandy tubes surrounded by juveniles or eggs (e.g. 18280), indicating some sort of brood protection. This further supports the separation of the species and negates the idea that the smooth simple setae may be worn dentate setae.

The presence in one estuary of two species which are morphologically similar is unusual, but this occurs in the Swan River, Western Australia, where both *C. aequisetis* and *C. pseudoerythraeensis* n.sp. coexist. However, this group of *Ceratonereis* with simple setae

(*pseudoerythraeensis* n.sp., *transversa* n.sp. and *amphidonta* n.sp.) appears to have radiated within southern Australia. A further two undescribed species in this complex probably occur in estuarine areas of N.S.W. (Hutchings & Glasby, in press).

*Ceratonereis vaipekae* Gibbs, 1972 from the Cook Islands generally resembles *C. pseudoerythraeensis* n.sp. but differs in that the notopodial lobes are acutely conical on all setigers, and the ventral neuropodial lobe although reduced posteriorly, still remains as a well developed lobe. The simple falcigers of *C. vaipekae* have a conical main fang with rows of small teeth above, with well developed tendon but only slightly darker and heavier than other setae whereas in *C. pseudoerythraeensis* n.sp. the simple falcigers are much heavier than the other setae.

The specific name refers to the similarity of the new species to *C. erythraeensis* Fauvel, with which it has been confused within Australia over many years.

*Australian Distribution:* Western Australia, South Australia, Victoria, New South Wales and Queensland.

*Habitat:* Estuarine areas in muddy sand often associated with seagrass beds.

**Ceratonereis transversa** n.sp.
FIG. 3a–g

HOLOTYPE: S.A.—03A (18398) anterior fragment of 123 setigers, 80 mm length and 3 mm wide. PARATYPES: 22A (AHF POLY 1349), 22A (BMNH ZB 1982:3), 03C (USNM 071529), 02B, 3 (18403), 02C, 1 (18402), 03A, 2 (18407), 03B, 1 (18406), 12A, 1 (18405), 13A, 7 (18400), 13A, 1 (18401), 13A, 1 (18399). Size range of intact specimens, 54 setigers, 6.9 mm length, 0.5 mm width to 144 setigers, 35 mm length, 1.9 mm width, anterior fragments up to 2.3 mm width.

*Additional Material:* W.A.—Bunbury (18474) coll. Snell.

*Description:* Head small, body width increasing gradually from head to robust flattened mid section, then tapering gradually posteriorly (Paratype 18401, Fig. 3a). Colour in alcohol pinkish brown with purplish glandular patches at base of dorsal cirrus, becoming more intense posteriorly. Prostomium length about equal to width with deep antero-median groove, 2 pairs of diffuse reddish eyes, 1 pair of small cylindrical palps, palpostyle globose. Tentacular cirri faintly annulated, longest extending to setiger 5. Eversible pharynx with slender transparent brown jaws, with 9 teeth. Paragnaths pale—dark brown cones, arranged as follows: I = 0; II = 6 in transverse line of large and small cones; III = 0; IV = 7 in transverse line of large and small cones; oral ring bare.

Dorsal cirrus 0.7–1.0 times length of dorsal notopodial lobe in anterior setigers (Fig. 3b), increasing posteriorly to about 2 times. Dorsal and ventral notopodial lobes conical, about equal in length. Presetal notopodial lobe slightly produced in anterior setigers as low ridge on base of ventral notopodial lobe, diminishing posteriorly (Fig. 3c,d). Dorsal neuropodial lobe in setigers 1–16 bearing large, digitiform postsetal lobe extending posterolaterally, frequently to or past notopodial lobes. Ventral neuropodial lobe conical, well developed anteriorly, then diminishing rapidly to be absent by middle setigers. Ventral cirrus reaching halfway to tip of ventral neuropodial lobe anteriorly and approximately to point of emergence of most ventral neurosetae in later setigers. Acicular dark brown-black with hyaline tips. For numbers and types of setae see Table 5. Giant simple falcigers (Fig. 3e) formed by gradual ankylosis and rearrangement of teeth of dorsal heterogomph falcigers over approximately setigers 20–30, strongly hooked with several small teeth above main fang, dark distally, without tendon. Heterogomph falcigers with elongate appendage, weakly hooked, finely toothed, proportions of appendage and shaft changing little posteriorly. Homogomph spinigers shown in Fig. 3f.

*Comments:* Variations not described for holotype include prostomium length 1.3–1.5 times width, eyes strongly pigmented to unpigmented, longest tentacular cirri extending to setiger 6–9. Jaw teeth 7–9. Paragnaths in II = 2–7 and IV = 3–9, dark brown, or transparent and visible only as refractile projections in transmitted light. Dorsal notopodial lobe decreasing to become absent in far posterior setigers on entire specimens. Number of anterior setigers with digitiform neuropostsetal lobes increasing roughly with size of specimen, up to the first 16–18 setigers in medium and large specimens to as few as the first 6 in very small specimens. Variation in numbers and types of setae for 9 paratypes shown in Table 5. Numbers of setae reducing to only a few in posterior setigers. A single specimen with intact anal cirri, very long, filamentous, extending over last 17 setigers.

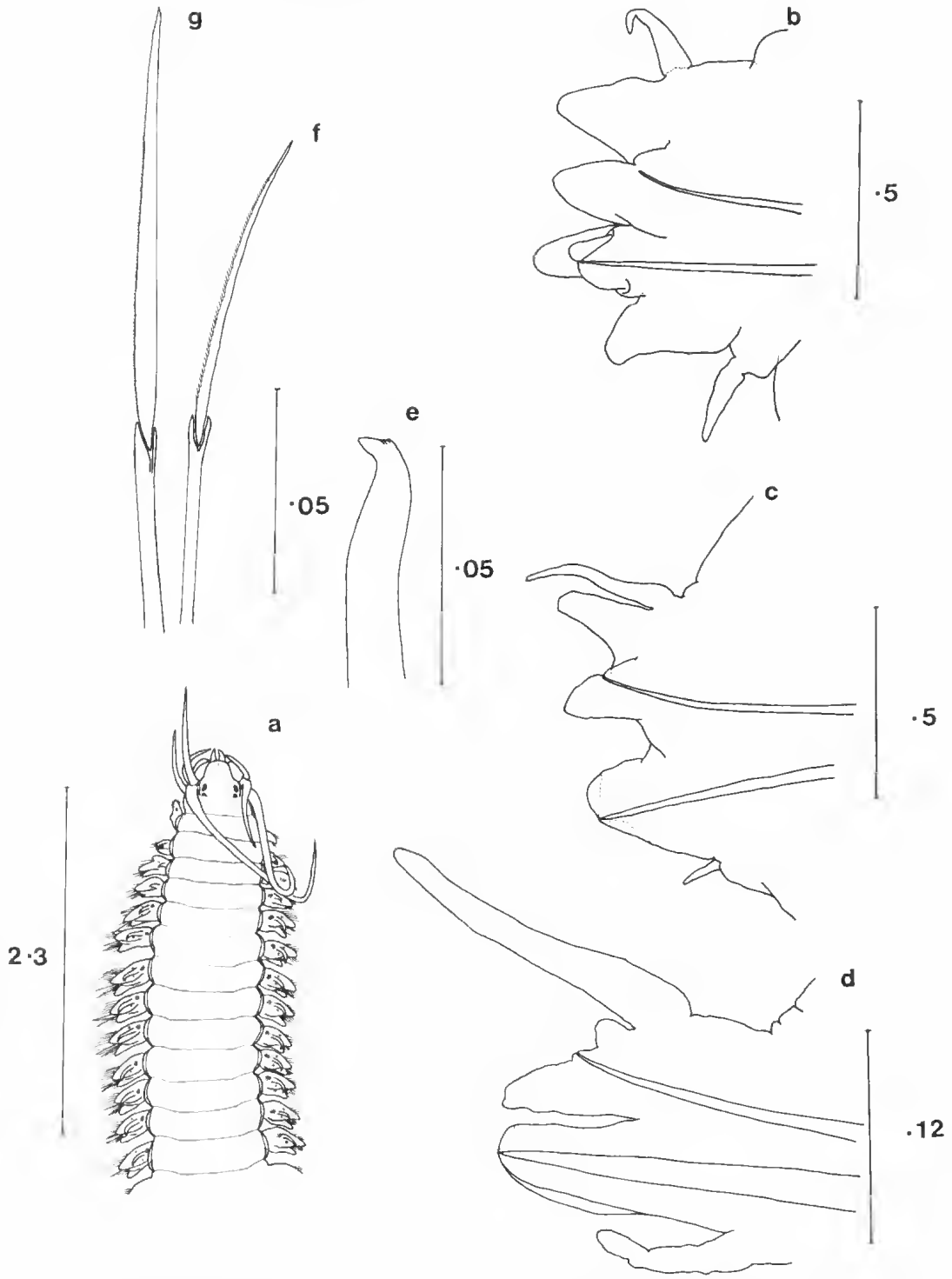


Fig. 3. *Ceratonereis transversa* n.sp. a. dorsal view of anterior end (Paratype 18401). b. anterior view of 11th parapodium. c. anterior view of 58th (early middle) parapodium. d. anterior view of 137th parapodium (USNM 071529). e. simple falciger. f. notopodial homogomph spiniger. g. natatory seta from subepitoke, from dorsal neuropodial fascicle. Scales in mm.

TABLE 5. *Setal counts for* Ceratonereis transversa *n.sp.*

| | No. of setae | |
|---|---|---|
| | Setiger 11 | Setiger 120 |
| *Notosetae* | | |
| homogomph spinigers | 6 (6–12)[a] | 5 (2–10) |
| *Neurosetae* | | |
| (i) Dorsal fascicle | | |
| above—homogomph spinigers | 14 (3–15) | 9 (2–7) |
| below—heterogomph falcigers | 8 (3–5) | — |
| —giant simple falcigers | — | 4 (–4) |
| (ii) Ventral fascicle | | |
| above—heterogomph spinigers | 20 (6–11) | 7 (1–12) |
| below—heterogomph falcigers | 16 (4–9) | 8 (3–9) |

[a] Numbers in brackets refer to the variation in numbers of setae occurring in 9 paratypes.

One paratype (18399) with some epitokal modification. Eyes large. Anterior parapodia unmodified. Epitokous parapodia developing gradually from about setiger 41–43 with increase in length of parapodial lobes relative to total body width but no accessory lobes. Natatory setae homogomph spinigers with slightly broader, very finely dentate appendages and shafts extremely long (Fig. 3g), 3–5 times length of appendage compared with 1–2 times length of appendage in normal spinigers, plus slightly reduced complement of normal setae.

*Discussion: Ceratonereis transversa* n.sp. belongs to the small group of *Ceratonereis* characterised by the presence of simple neuropodial falcigers. It can be distinguished from the other species in this complex occurring in Australia (See key) by the absence of paragnaths in Area III of the pharynx. *Ceratonereis transversa* n.sp. differs from *C. valpekae* Gibbs, 1972 in the arrangement of paragnaths and the presence of well-developed postsetal neuropodial lobes in anterior parapodia.

The name, *transversa* refers to the transverse arrangement of paragnaths on the pharynx in Areas II and IV.

*Australian Distribution:* South Australia.

*Habitat:* Associated with mud flats and seagrass beds.

*Micronereis* Claparède

Pharynx eversible without papillae or paragnaths. Two pairs of tentacular cirri present; parapodia biramous. No apodous segment immediately posterior to peristomium. Antennae absent. All setae homogomph spinigers. Type species: *M. variegata* Claparède.

*Micronereis halei* Hartman
FIG. 4a

*Micronereis halei* Hartman, 1954:25, Figs. 18–21. Paxton (in press).

*Material Examined:* S.A.—23A, 12 spec. (18380). 34A, 1 (18379).

*Description:* Size range, 19 setigers, 3.2 mm length, 0.75 mm width, to 25 setigers, 6.3 mm length, 1.1 mm width. Prostomium rounded, with pair of ventral palps and 2 pairs of lensed eyes. Antennae absent. Four pairs of weakly biarticulated tentacular cirri. Pharynx without paragnaths. Parapodia with homogomph spinigers, appendages finely serrated, becoming shorter and enclosed in transparent cylindrical sheet ventrally with teeth more restricted to base.

Males with sperm morulae present in coelom, with additional accessory cirri (= digitate lobes, Hartman 1954). Some spinigers modified (= falcigers of Paxton, in press), with appendage more coarsely toothed distally, extremity enclosed in sub-spherical transparent cap displaced towards edge denticulated (Fig. 4a). Gravid female, with large yolky eggs, lacking accessory cirri and modified spinigers.

*Comments:* Our material agrees well with Hartman's (1954) and Paxton's (in press) descriptions and we have been able to add comments on gravid females. In some of our epitokous males the spinigers appear to be more coarsely toothed than figured by Paxton, and we disagree with her interpretation that they are falcigers.

*Australian Distribution:* South Australia.

*Habitat:* Associated with algae and sheltered rock pools.

*Namanereis* Chamberlin, emended

Eversible pharynx smooth or with soft papillae. Three or four pairs of tentacular cirri present; parapodia sub-biramous with 2 acicula, but no development of notopodial lobes. Dorsal cirrus compact. Neurosetae include homogomph spinigers and falcigers. Notosetae all spinigers.

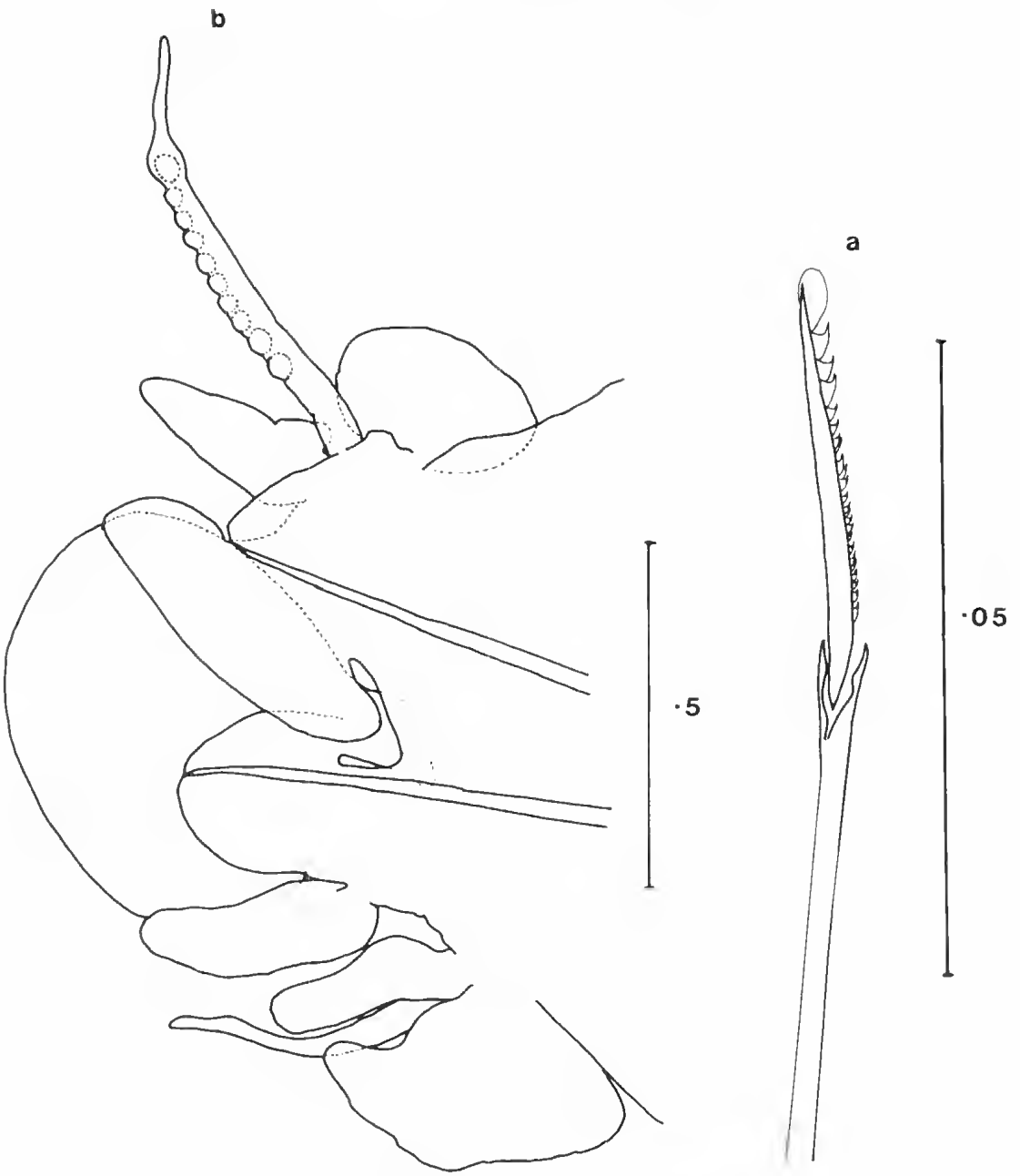


Fig. 4. *Micronereis halei* a. modified notopodial seta from male epitoke. *Nereis cockburnensis*. b. anterior view of epitokous parapodium, setiger 41. Scales in mm.

Type species: *Lycastis quadraticeps* Gay

*Discussion:* The above generic diagnosis considerably expands Chamberlin's diagnosis, with details regarding the setae and the sub-biramous parapodia.

Gay originally placed his species in *Lycastis* Savigny which Chamberlin (1919) found was preoccupied, proposed the name *Namanereis* and designated *N. quadraticeps* as the type-species.

There is confusion in the literature as to the terminology of parapodia with two acicula but lacking the development of notopodial lobes. Strictly speaking, these are biramous but perhaps the term sub-biramous is more appropriate. Hartmann-Schröder (1977) in a

key to the Nereididae lacking paragnaths indicates that *Namanereis* lacks capillary notosetae, although the parapodia are subbiramous. Unfortunately, she provides no explanation of this loss of notosetae in the generic diagnosis, and it is not accepted by us.

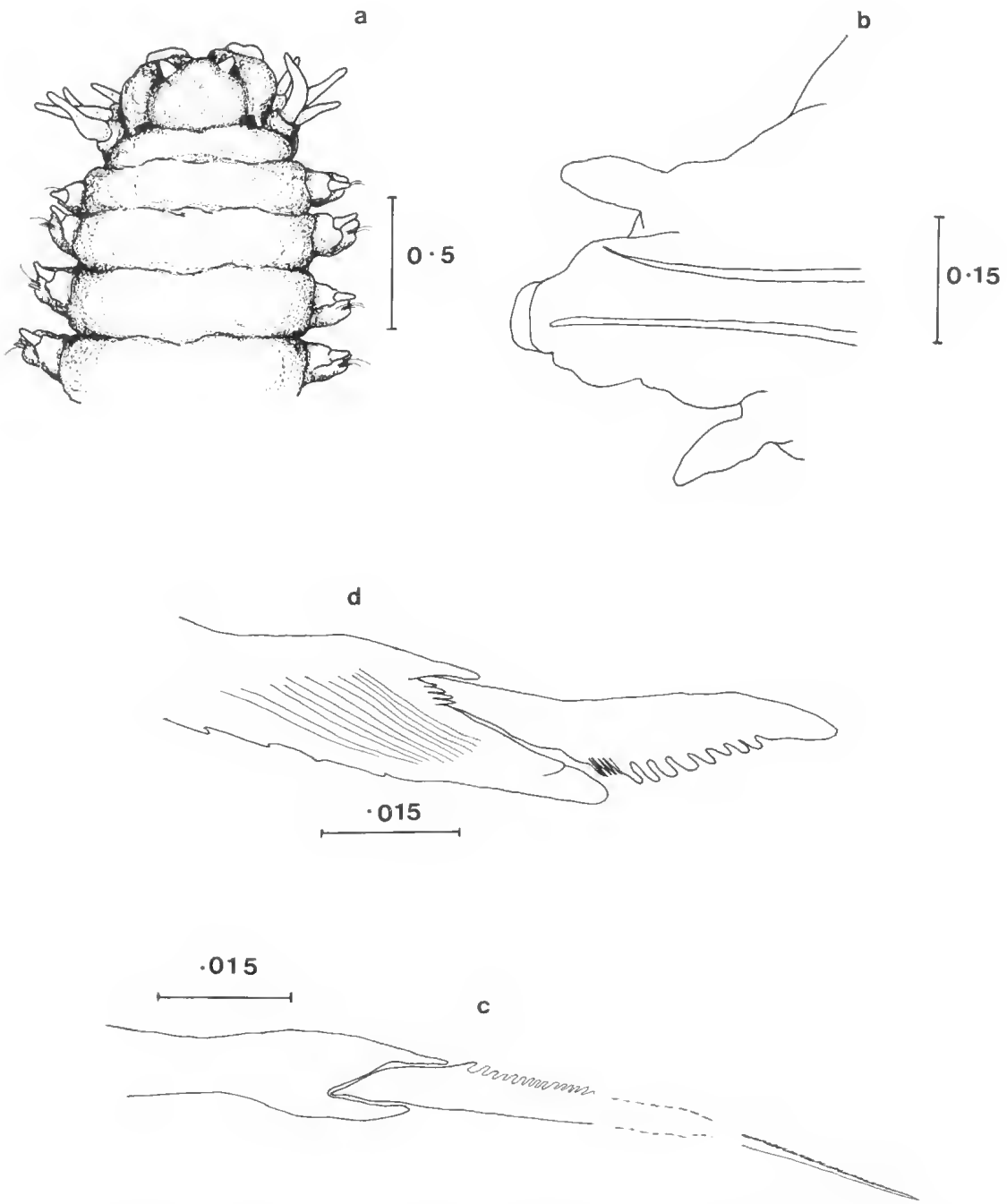


Fig. 5. *Namanereis littoralis* n.sp. a. dorsal view of anterior end. b. anterior view of 16th parapodia. c. notopodial homogomph spiniger (in part). d. neuropodial heterogomph falciger. Scales in mm.

**Namanereis littoralis** n.sp.

FIG. 5a–b

*Namanereis quadraticeps*,—Benham, 1909: 242–244, Pl. IX, figs. 2–10. Augener, 1924: 39–40, *Non* Gay.

HOLOTYPE: S.A.—Port Adelaide, mangroves, North Arm (6004) coll. Butler 10.4.73; 80 setigers, 2 cm length, 1.5 mm wide, complete.

PARATYPES: N.S.W.—Towra Point, Botany Bay, mudflat (AHF POLY 1350) 66 setigers, 20 mm length, 1.0 mm width, complete. (BMNH ZB 1982: 4) 79 setigers, 23 mm length, 1.5 mm width, complete. (USNM 071530) 52 setigers, 22 mm length, 1.5 mm width, complete. 2 (12314) 47 setigers, 8 mm length, 0.8 width; 47 setigers, 11 mm length, 0.8 mm width; coll. N.S.W. Lit. Society, 27.6.77. S.A.—Garden Island, Port Adelaide (6774), coll. Zool. Dept. Univ. of Adelaide 10.12.77.

*Additional Material Examined: Lycastis quadraticeps* Auckland Port Ross (HZM V9373), det. Augener. Magalh. Str. Punta Arenas; beach under stones (HZM V4780), det. Ehlers.

*Description:* Preserved body opaque white. Prostomium truncate, oval shaped. One pair antennae, small biarticulate. Globular palps with small spherical palpostyles. Two pairs of eyes at base of prostomium, posterior pair partially hidden by peristomial fold. Four pairs of short tentacular cirri extending to posterior margin of setiger 1. Peristome achaetous, narrow. Pharynx lacking paragnaths or papillae, with pair of chitinised jaws. Jaws with terminal tooth and 3 basal teeth.

Parapodia sub-biramous with 2 thick dark brown acicula, not protruding. Dorsal cirrus as small leaf-shaped palpode arising from glandular base, similarly developed throughout length of body (Fig. 5a); in some paratypes slight increase in size posteriorly. Notopodial lobes absent. Neuropodia with oval pre- and postsetal lobes, presetal slightly longer. Single heterogomph spiniger with finely feathered blade associated with notopodial aciculum. Neurosetae long-bladed heterogomph spinigers with blades finely serrated and heterogomph, short-bladed, coarsely-toothed falcigers, granular inclusions in shaft (Fig. 5b). Setal counts constant along body, neurosetae 1–2 spinigers and 6–7 falcigers. Body constricted posteriorly, pygidium with terminal anus and 2 short thick divergent anal cirri.

*Discussion:* Benham (1909) described nereid worms from the supralittoral zone of Campbell Island as *Lycastis quadraticeps* Gay, 1849. He did not examine Gay's material and expressed doubt about his identification. Gay (1849) described his material from Calbuco, Chile, with uniramous parapodia greatly projecting, particularly the anterior ones, with few setae and dorsal cirri very small. Gay's only figure of the entire worm is not large enough to differentiate any details. Subsequently, Gay's species was reported by Ehlers (1897), (1900), (1901) and (1913) from the Straits of Magellan in 2.7 fms; Punta Arenas, intertidally; and St Paul, Ebbestrand, all in South America. Ehlers provides no descriptions, however. In contrast, Benham clearly figures the parapodia with 2 acicula although notopodial lobes are absent. Subsequently, Augener (1923) reported the species from Port Ross, Auckland Island (which is the same biogeographic area as Campbell Island) with little comment and no description.

Later, Fauvel (1941) described the species from Mission à terre, Cape Horn, with uniramous parapodia but with a few fine notosetae (presumably spinigers) present. Subsequently, Hartman (1964) reported the species from the Antarctic and quotes all these authors, not apparently examining any material. The figures she provides are copies of Benham's (1909) figures.

We believe that it is not possible to substantiate whether or not Benham's material from Campbell Island was the same as Gay's. Benham's material is not in existence and attempts to locate Gay's material have been unsuccessful. Benham himself expressed doubts. Our material from Australia appears to be identical with that of Benham's and we have decided to describe it as a new species as we consider Gay's species to be indeterminate. By this, we are endeavouring to clarify the situation. The species from South America will need to be redescribed based on the location of all Ehler's material or on new collections. Only then can a decision be made as to whether in fact one or two species are involved. If only one is, then this species is circumpolar. The identity of *N. quadraticeps* is important as it is the type-species of the genus. Recently some fresh material from Chile has been seen by Hutchings, which will be described, and may be *N. quadraticeps*. This material differs from *N. littoralis* n.sp.

Finally Hartman (1959) synonomised *N. kerguelensis* Treadwell, 1926 with *N. quadraticeps* with no comment. Treadwell's descrip-

tion does not agree with our material or Benham's. Notosetae are absent in *N. kartaboensis* and the development of the dorsal cirrus resembles those more typically found in the genus *Namalycastis*. Treadwell's material also needs to be re-examined.

The specific name refers to the position on the shore where the animal lives.

*Australian Distribution:* South Australia, New South Wales.

*Habitat:* Associated with mangroves, often in the supralittoral zone.

*Neanthes* Kinberg

Pharynx eversible with conical paragnaths on both oral and maxillary rings. Four pairs of tentacular cirri. Parapodia biramous. Notosetae homogomph spinigers; neurosetae homo- and heterogomph spinigers and heterogomph falcigers.

Type species: *N. vaalii* Kinberg.

**Neanthes biseriata** n.sp.

FIG. 6a–d

HOLOTYPE: S.A.—06B (18417) 64 setigers, 15 mm length, 1.9 mm width. PARATYPES: 06B, 13 (AHF POLY 1351), 09B, 6 (BMNH ZB 1982: 5–10), 18A, 9 (USNM 071531), 04A, 4 (184231), 06B, 40 (18418), 09A, 1 (18419), 18A, 46 (18420), 19A, 2 (18428) ♀ epitoke, 19B, 6 (18426) ♂ epitoke, 19D, 3 (18429), 21A, 1 (18421), 21A, 14 (18422), 26A, 1 (18425), 32C, 1 (18424). Paratypes range in size from 44 setigers, 6.7 mm length, 0.9 mm width to 63 setigers, 18 mm length, 1.9 mm width.

*Description:* Robust flattened body, dull pinkish brown in alcohol. Prostomium length 1.25 times width. Two pairs of bluish red eyes. One pair of palps, stout, compressed, palpostyles small, globular. Four pairs of tentacular cirri, long, distally tapered, longest extend to setiger 8. Antennae and tentacular cirri with fine irregular annulations. Jaws short, robust. Pharynx with dark brown conical paragnaths, as follows: I = 6 in diamond; II = 14 in triangular patch of 3–4 irregular oblique rows of medium sized cones plus few small cones; III = 36 large cones in transverse oval patch; IV = 30 in rectangular patch; V = 7 in triangular patch with large cones anteriorly, smaller cones behind; VI = 17 forming transverse arc of large cones with arc of small cones behind, including continuations of groups from V and VIII; VII–VIII about 100, in broad band 3–4 deep ventrally reducing to 2 laterally, anterior rows with large cones and posterior rows with numerous small cones.

Dorsal cirrus 2–5 times length of dorsal notopodial lobe. Dorsal and ventral notopodial lobes short, broadly conical anteriorly, (Fig. 6a) lobes and notopodium as a whole becoming more elongate posteriorly (Fig. 6b). Presetal notopodial lobe a low ridge on ventral notopodial lobe, decreasing posteriorly. Dorsal neuropodial lobe extending past notopodial lobes anteriorly, shorter posteriorly. Ventral neuropodial lobe bluntly conical in the first setiger, becoming shorter, rounded, then progressively fusing with dorsal neuropodial lobe so that free part reduced to small tubercle by about setiger 18. Ventral cirrus almost or just reaching tip of ventral neuropodial lobe anteriorly, extending just beyond posteriorly. Acicula dark brown. For numbers and types of setae see Table 6. Shafts of falcigers (Fig. 6d) thicker than for spinigers and becoming slightly thicker posteriorly. Falciger appendages moderately hooked, coarsely toothed basally and with long, fine, indistinct tendon, becoming shorter, broader, more strongly hooked posteriorly with teeth finer and more restricted to basal region. Anal cirri extending over last 8 setigers.

Male epitoke (18426), almost fully mature. Eyes large, blue-black. Paragnaths as for atoke. Dorsal cirri on setigers 1–7 and ventral cirri on setigers 1–5 basally swollen. Epitokous parapodia from setiger 15. Dorsal cirri with large round tubercles ventrally, except for last 20 setigers. Additional digitiform lobes above bases of dorsal and ventral cirri. Large fan-shaped lobe medially on base of ventral cirrus. Dorsal neuropodial lobe with fan-shaped postsetal lobe produced dorsolaterally, ventral neuropodial lobe digitiform. Dorsal and ventral notopodial lobes flattened, bladelike, presetal notopodial lobe produced as flattened ridge. Additional lobes least developed in anterior and posterior parapodia.

Female epitoke (18428) as for male epitoke (18426) except epitoky is less advanced. Epitokous development occurs from setiger 18. Dorsal cirri inflated on setigers 1–6 only and ventral cirri on setigers 1–4. Epitokous dorsal cirri normal, not tuberculate, and ventral neuropodial lobe not reaching dorsal neuropodial lobe (Fig. 6c).

*Comments:* Additional variations not described for holotype include prostomium length 1–1.25 times width, eyes reddish to bluish black.

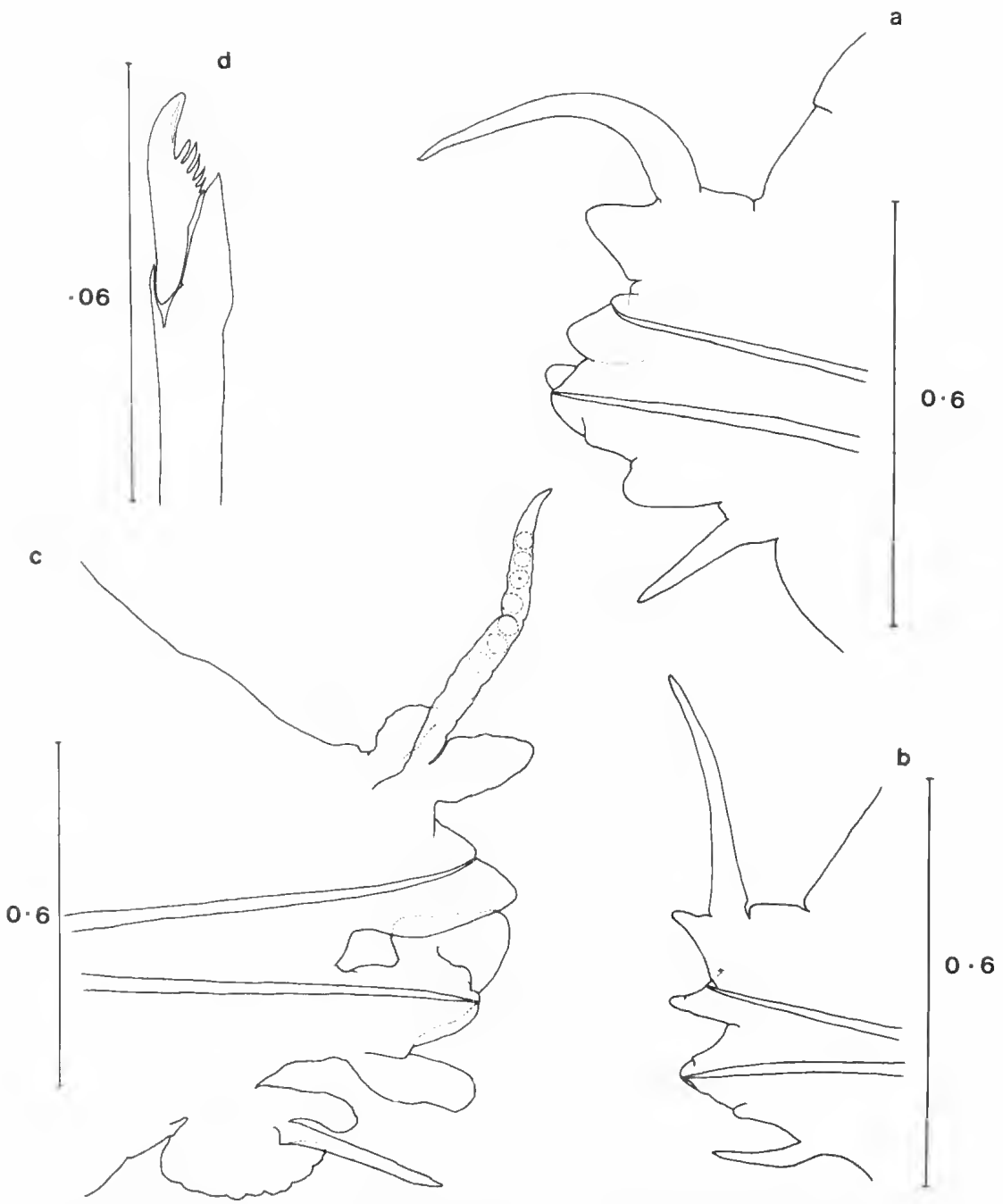


Fig. 6. *Neanthes biseriata* n.sp. a. anterior view of 11th parapodium. b. posterior view of 56th parapodium. c. anterior view of 34th parapodium with early epitokal modifications. d. ventral neuropodial heterogomph falciger, setiger 11. Scales in mm.

longest tentacular cirri extending to setiger 7–12. Paragnaths I = 2–6, often as longitudinal series with a few behind; II = 8–16; III = 16-41; IV = 16–38; V = 3–7; VI = 11–24 arranged as for holotype, central arcs of large and small cones variably but usually only slightly separated from continuations of groups V and VIII into VI; VII–VIII = 58–

TABLE 6. *Setal counts for* Neanthes biseriata *n.sp.*

| | No. of setae | | |
|---|---|---|---|
| | Setiger 11 | Setiger 31 | Setiger 56 |
| *Notosetae* | | | |
| homogomph spinigers | 7 (4–10)* | 5 (2–5) | 2 (1–3) |
| *Neurosetae* | | | |
| (i) Dorsal fascicle | | | |
| above—homogomph spinigers | 5 (2–8) | 3 (2–5) | 4 (2–4) |
| below—heterogomph falcigers | 2 (1–3) | 2 (1–2) | 1 (1–2) |
| (ii) Ventral fascicle | | | |
| above—homogomph spinigers | 1 (1–2) | 1 (1) | 1 (1–2) |
| below—heterogomph falcigers | 9 (5–9) | 4 (3–6) | 3 (1–3) |

* Numbers in brackets refer to the variation in numbers of setae occurring in 10 paratypes.

91. Large individuals generally with more abundant paragnaths. In small individuals the dorsal notopodial lobe may decrease in size posteriorly and may disappear. Ventral neuropodial lobe reduced to rounded tubercle or triangular flap posteriorly; in far posterior may increase slightly in size or disappear.

Variation in numbers and types of setae shown in Table 6. Large individuals generally with more abundant setae. Anal cirri extending over last 6–11 setigers.

*Discussion: Neanthes biseriata* n.sp. belongs to the group of *Neanthes* species which have only two well developed notopodial lobes, and with paragnaths on all areas of the pharynx including a broad band on Areas VII–VIII. Within this group, *N. crucifera* (Grube, 1878), *N. macrocephala* (Hansen, 1882) differ markedly in the shape of the parapodia and the number and arrangement of the paragnaths from *Neanthes biseriata* n.sp. *Neanthes larentukana* (Grube, 1881) *N. vitabunda* (Pflugfelder, 1933), *N. willeyi* (Day, 1934), and *N. vaalii* (Kinberg, 1866) differ from *Neanthes biseriata* n.sp., in the arrangement of the paragnaths. *Neanthes latipalpa* (Schmarda, 1861) is poorly described, no paragnath counts are given, and it appears that the notopodia although bilobed anteriorly, become simple posteriorly. Unless the type of this species can be found, re-examined, and fully described we consider that this species is indeterminable.

Other species in this group, *N. cortezi* Kudenov, 1979, *N. pseudonoodti* Fauchald, 1977*b*, and *N. noodti* Hartmann-Schröder, 1962 and characterised by the dorsal notopodia of posterior segments becoming extremely elongate, cirriform, bearing the dorsal cirrus as a short terminal filament. In *Neanthes biseriata* n.sp. the two notopodial lobes do not become extremely elongate posteriorly and the dorsal cirrus is well developed, arising from the base of the dorsal lobe. *Neanthes roosevelti* Hartman, 1939 has 2 large and about 50 minute paragnaths on Area I and 50 minute ones in Area V of the pharynx, which is very different to the pattern found in *Neanthes biseriata* n.sp. Finally, the last species in this group, *N. augeneri* (Gravier & Dantan, 1934) lacks homogomph spinigerous neurosetae whereas in *Neanthes biseriata* n.sp. these are present amongst the dorsal neurosetae. For these reasons we have described *Neanthes biseriata* as a new species.

The name refers to the arrangement of paragnaths in Area VI of the pharynx.

*Distribution:* South Australia.

*Habitat:* Sand, in amongst algae, or in crevices or under rocks.

*Neanthes cricognatha* (Ehlers)

*Nereis cricognatha* Ehlers, 1904: 29–30, Pl. IV, figs 3–7.

*Neanthes cricognatha*.—Knox, 1951: 217–218, Pl. 45, figs 6–8. Hartman, 1954: 14. Hutchings & Rainer, 1979: 754.

*Neanthes* near *cricognatha*.—Hartman, 1954: 14, 28. Previous synonomies given by Day & Hutchings, 1979.

*Material Examined:* S.A.—02B, 1 spec. (18301), 12B, 1 (18302), 27A, 1 (18300).

*Description:* Size range, 43 setigers, 11.5 mm length, 1.6 mm width to 53 setigers, 23 mm length, 3.0 mm width. Pharynx with conical paragnaths (individual counts given for material in order of stats. 12B, 02B and 27A): I = 13, 12, 16 in diamond or triangular patch; II = 26–29, 27–29, 33–34, oblique crescent or ellipse of 2 irregular rows, largest cones towards jaws; III = 28, 36, 63 in approximately circular patch; IV = 29–30, 43–44, 45–47, in triangular patch; V, VI, VII, VIII = continuous band, 5 deep ventrally, 2 deep

dorsally with a row of somewhat larger, slightly curved cones towards jaws; continuous broad band of small cones 5–7 deep; band of small cones narrower in VI and absent in V with row of large, crescent-shaped cones towards jaws.

Notopodia with 3 triangular lobes, presetal lobe compressed, elongate, acutely triangular decreasing in size posteriorly. Neuropodia with 2 main lobes, dorsal and ventral, dorsal with triangular postsetal lobe decreasing posteriorly. Notosetae homogomph spinigers only. Neurosetae with heterogomph falcigers and homogomph spinigers both dorsally and ventrally.

*Comments.* Considerable variation occurred between specimens in the length-width ratios of the appendages of the heterogomph falcigers, length ranging from 8–10 times the width to 3–3.5 times.

Our limited material covers the ranges of paragnath counts and patterns given by Hartman (1954) for *N. cricognatha* and *N.* near *cricognatha*, and we suggest that *N.* near *cricognatha* is just a form of *N. cricognatha*.

*Australian Distribution:* Western Australia, South Australia, Victoria, New South Wales (Careel Bay).

*Habitat:* Associated with *Posidonia*, mud flats and sponges growing in fast-flowing channels.

**Neanthes isolata** n.sp.
FIG. 7a–d

HOLOTYPE: S.A.—04B (18440), 53 setigers, 15 mm length, 2.1 mm width. PARATYPES: 19a, 4 (AHF POLY 1352), 08A, 6 (BMNH ZB 1982: 11–16), 32A, 4 (USNM 071532), 04A, 6 (18442), 04B, 2 (18441), 06B, 3 (18448), 08A, 2 (18443), 18A, 3 (18447), 19A, 1 (18444), 19B, 1 (18445), 20A, 2 (18449), 21A, 3 (18450), 30A, 1 (18452), 32C, 2 (18446). Size range, 42 setigers, 6 mm length, 0.6 mm width to 47+ setigers posteriorly incomplete 15 mm length, 2.1 mm width.

*Description:* Body anteriorly robust and flattened, tapering posteriorly, colour pink in alcohol, pharynx partially everted. Prostomium, length equal to width. Two pairs of deeply embedded, dull reddish eyes. Palps as long as wide, stout, slightly compressed, styles globular. One pair of antennae. Four pairs of tentacular cirri, longest extending to setiger 7–8, irregularly annulated, more distinctly towards tips. Pharynx with jaws translucent, dark brown, short, robust. Paragnaths all conical, dark purple-brown arranged as follows: I = 1; II = 9–11 in 2 oblique rows; III = 16 in circular patch; IV = 18–20 in transverse rectangular patch; V = 2 large cones in longitudinal series with 2 small cones behind; VI = 8–11 cones, large to small, continuous with groups in V and VIII but with small, isolated, irregular patch of 3–5 in centre; VII–VIII = 51 large and medium sized cones in continuous band 4 deep ventrally, 2 deep laterally, small cones rare.

Dorsal cirrus 2–3 times length of dorsal notopodial lobe anteriorly, 3–5 times posteriorly. Dorsal and ventral notopodial lobes bluntly conical anteriorly (Fig. 7a) becoming more rounded in setigers 6–12, then more pointed posteriorly (Fig. 7b). Presetal notopodial lobe maximally produced in middle setigers as low, thick ridge on base of ventral notopodial lobe, well-developed anteriorly becoming negligible posteriorly. Notopodium becoming inflated around base of dorsal cirrus in posterior parapodia but with little elongation. Dorsal neuropodial lobe extending to about level with ventral notopodial lobe, ventral neuropodial lobe shorter, becoming more pointed posteriorly and remaining free with little decrease in relative size. Ventral cirrus almost or just reaching tip of ventral neuropodial lobe anteriorly, extending just beyond posteriorly. Acicula brown-black, hyaline at tips. For numbers and types of setae see Table 7. Appendages of heterogomph falcigers (Fig. 7c,d) coarsely toothed basally, tip moderately hooked, blunt to sharply angular with fine, closely applied tendon, becoming relatively shorter and broader posteriorly with finer teeth and more widely separated tendon. Shafts of falcigers thicker than for spinigers, becoming slightly thicker posteriorly.

Anal cirri extending over last 5 setigers.

*Comments:* Additional variations not described for holotype include peristomium length 0.75–1.5 times width, eyes reddish to blue-black with lenses clearly visible or indistinct, longest tentacular cirri extending to setiger 5–8. Paragnaths I = 1 or occasionally 2 in longitudinal series; II = 6–10 in 2–3 oblique rows; III = 8–12 in circular or oval patch; IV = 8–16 in transverse rectangle or triangle; V = 2–3 large cones in longitudinal series with 1–3 small cones behind; VI = 6–11 with 2–5 in isolated central patch; VII–VIII = 37–55 arranged as for holotype, frequently with small cones scattered, common laterally but rare ventrally. Dorsal neuropodial

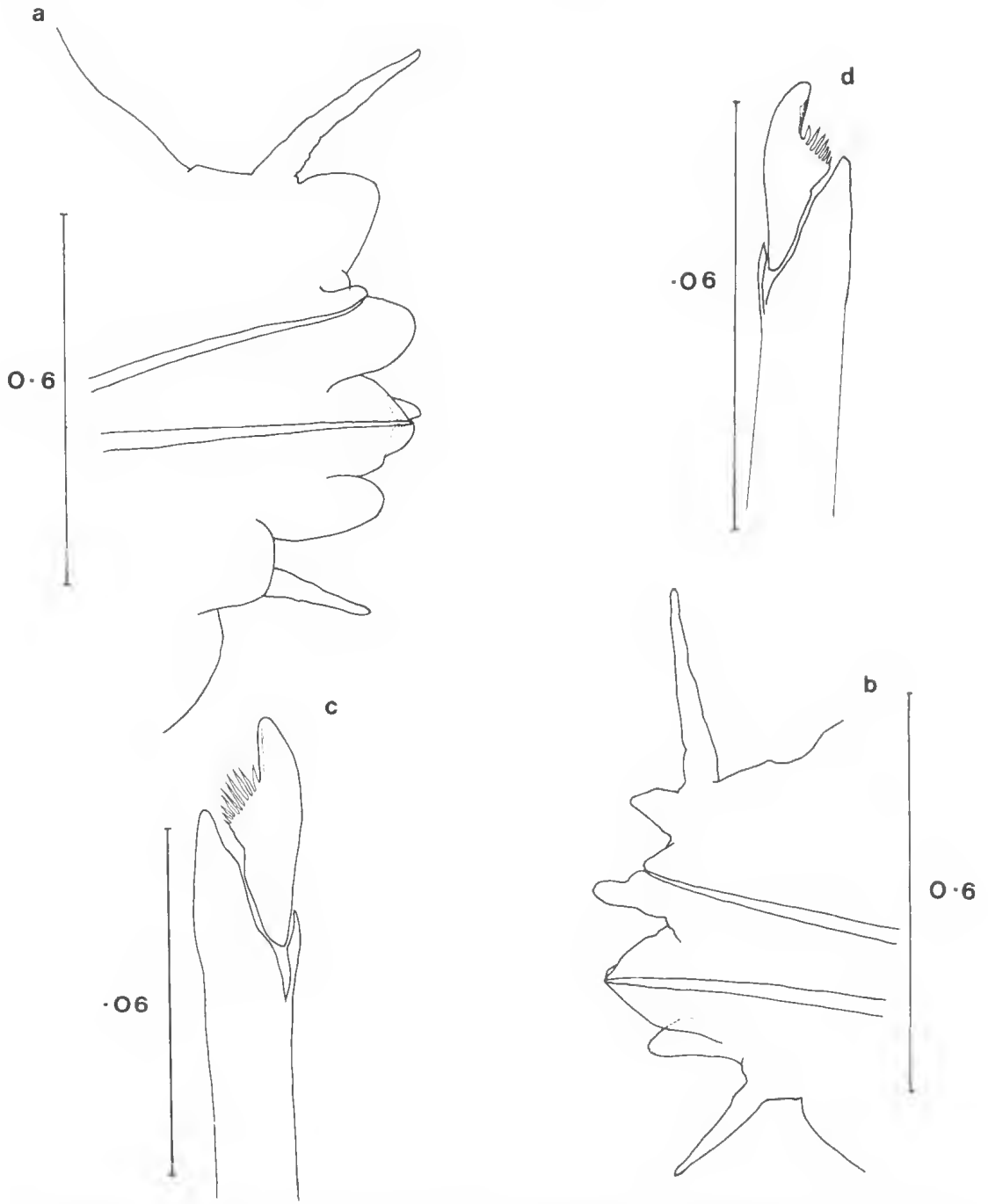


Fig. 7. *Neanthes isolata* n.sp. a. anterior view of 11th parapodium. b. anterior view of 46th parapodium. c. Dorsal neuropodial heterogomph falciger, setiger 11. d. ventral neuropodial heterogomph falciger, setiger 47. Scales in mm.

lobe sometimes level with or shorter than notopodial lobes. Rounding of notopodial lobes in anterior parapodia generally slight, most noticeable in large specimens. Dorsal notopodial lobe may diminish in posterior setigers. Variation in numbers and types of setae shown in Table 7. Larger individuals generally with more abundant setae.

TABLE 7. *Setal counts for* Neanthes isolata *n.sp.*

| | No. of setae | | |
|---|---|---|---|
| | Setiger 11 | Setiger 29 | Setiger 46 |
| *Notosetae* | | | |
| homogomph spinigers | 8 (3–14)* | 5 (3–7) | 3 (1–4) |
| *Neurosetae* | | | |
| (i) Dorsal fascicle | | | |
| above—homogomph spinigers | 6 (2–9) | 3 (2–6) | 1 (0–2) |
| below—heterogomph falcigers | 2 (2–3) | 2 (1–2) | 2 (1–2) |
| (ii) Ventral fascicle | | | |
| above—heterogomph spinigers | 1 (1–2) | 1 (1–2) | 2 (0–2) |
| below—heterogomph falcigers | 7 (5–8) | 4 (3–5) | 3 (2–4) |

* Numbers in brackets refer to the variation in numbers of setae occurring in 9 paratypes.

Anal cirri extending over last 4–8 setigers.

*Discussion: Neanthes isolata* n.sp. belongs to the same group of *Neanthes* as *N. biseriata* n.sp. and *N. uniseriata* n.sp. in having only two well developed notopodial lobes and paragnaths in all areas of the pharynx including a broad band of paragnaths on Areas VII–VIII. Within this group three species, *N. cortezi* Kudenov, 1979, *N. noodti* Hartmann-Schröder, 1962, and *N. pseudonoodti* Fauchald, 1977b have the dorsal notopodial lobe becoming extremely elongate posteriorly and bearing the dorsal cirrus at its tip. This does not occur in *Neanthes isolata* n.sp. *Neanthes biseriata* n.sp. and *N. uniseriata* n.sp. differ in the arrangement of paragnaths and in the reduction of the ventral neuropodial lobe (see Key).

The other species in this group, *N. augeneri* (Gravier & Dantan, 1934), *N. crucifera* (Grube, 1878), *N. larentukana* (Grube, 1881), *N. macrocephela* (Hansen, 1882), *N. rooseveltí* (Hartman, 1939), *N. vitabunda* (Pflugfelder, 1933), and *N. willeyi* (Day, 1934), can be distinguished from *Neanthes isolata* n.sp. by the arrangement and number of paragnaths. *Neanthes isolata* n.sp. most closely resembles *N. vaalli* (Kinberg, 1866) but can be distinguished by the arrangement of the paragnaths, particularly on Areas V and VI. For these reasons *Neanthes isolata* is described as a new species.

The name refers to the arrangement of the paragnaths in Area VI of the pharynx.

*Distribution:* South Australia.

*Habitat:* Algal holdfasts, coralline algae, in sand, crevice fauna.

*Neanthes kerguelensis* (McIntosh)

*Nereis kerguelensis* McIntosh, 1885: 225–227, Pl. 35, fig. 10–12, Pl. 16a, fig. 17, 18.

*Neanthes kerguelensis.*—Hartman, 1954: 30.

*Material Examined:* W.A.—Three Mile Reef, City Beach, Perth (18492) coll. Coleman. S.A.—17A, 5 spec. (18376), 24A, 17 (18377).

*Description:* Size range, from 39 setigers, 8.4 mm length, 1.1 mm width to 64 setigers, 30 mm length, 5.8 mm width. Pharynx with flattened conical paragnaths varying from dark brown to almost colourless, arranged as follows: I = 0; II = 3–10 rarely up to 13, in 2 oblique rows; III = 0–10, rarely up to 16 in an oval patch; IV = 6–11, rarely 3–18 in oval or triangular patch; V = 0, occasionally 1; VI = 0; VII–VIII = 0–4, large if present, on ventral portion of ring in regularly spaced row.

Neuropodia with digitiform postsetal lobe present in all but extreme posterior setigers. Notopodium becoming dorsally inflated and notopodial lobes extending further posteriorly except in small specimens in which dorsal notopodial lobe often reducing posteriorly to become absent.

Notosetae all homogomph spinigers, blade becoming short and broad posteriorly, neurosetae homogomph spinigers and heterogomph falcigers both dorsally and ventrally; rarely with a few heterogomph spinigers ventrally. Falciger appendages coarsely toothed with indistinct tendon.

*Comments:* In our material some individuals may lack oral paragnaths or have very pale paragnaths which are extremely difficult to see. Such specimens are otherwise identical to those with oral paragnaths.

*Australian Distribution:* South Australia, Tasmania, Victoria and New South Wales.

*Habitat:* Associated with encrusting fauna.

**Neanthes uniseriata** n.sp.

FIG. 8a–c

HOLOTYPE: S.A.—30D (18430) 72 setigers, 27 mm length, 2.9 mm width. PARATYPES: 30D,

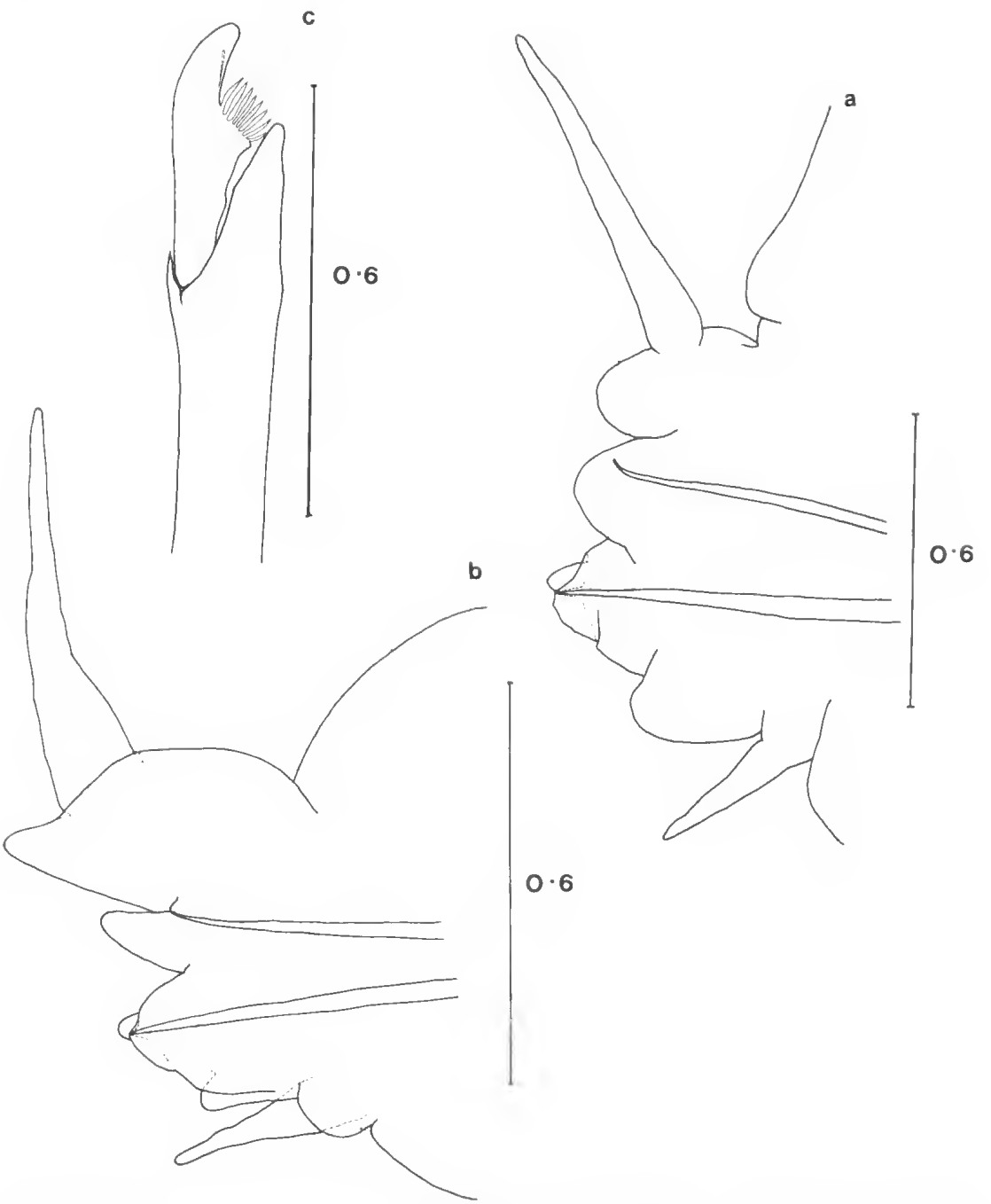


Fig. 8. *Neanthes uniseriata* n.sp. a. anterior view of 10th parapodium. b. anterior view of 63rd parapodium. c. ventral neuropodial heterogomph falciger. Scales in mm.

8 spec. (AHF POLY 1353). 30D, 8 (BMNH ZB 1982: 17–24). 30D, 8 (USNM 071533). 06B, 2 (18438). 09B, 4 (18436). 18A, 14 (18435). 23A, 4 (18437). 30A, 50 (18432). 30C, 12 (18433). 30D, 62 (18431). 30E 1 (18434). 34A, 6 (18439). Entire specimens range from 45 setigers, 5.3 mm length, 0.7 mm width to 67 setigers, 25 mm length, 2.8 mm width, anterior fragments up to 3.5 mm width.

*Additional Material:* Vic.—Flinders, on ocean platform (4403) coll. Smith & Ponder.

*Description:* Robust, flattened body, dull

pinkish brown in alcohol. Prostomium as long as wide with 2 pairs of deeply embedded blue-black eyes. Palps laterally compressed, stout, palpostyles small, globular. Four pairs tentacular cirri, short, stout, faintly irregularly annulated, longest extend to setiger 5. Pharynx with short, robust, translucent dark brown jaws. Paragnaths all cones, brown, arranged as follows: I = 3 in triangle; II = 8 in elongated triangle of 2 oblique rows; III = 4 in small patch; IV = 12–15 in 2–3 transverse lines; V = 4, in inverted Y; VI = 9–12 large cones in oblique arc continuous with V and VIII, single row except for lateral extremity; VII–VIII = 38 large and medium cones in band 2–4 deep ventrally, 2 deep laterally, small cones rare and scattered through band.

Dorsal cirri increasing in length posteriorly, anteriorly 3–4 times length of dorsal notopodial lobe, posteriorly 4–5 times. Base of cirrus expanded, increasing posteriorly. Dorsal and ventral notopodial lobes anteriorly bluntly conical becoming shorter, rounder almost globose in setigers 6–15 (Fig. 8a) then gradually conical posteriorly (Fig. 8b). Presetal notopodial lobe developed maximally in middle setigers as low rounded ridge on ventral notopodial lobe. Notopodium medial to dorsal cirrus becoming slightly elongated and markedly inflated posteriorly, dorsal notopodial lobe strongly reduced in last few setigers. Dorsal neuropodial lobe extending past notopodial lobes anteriorly, shorter posteriorly. Ventral neuropodial lobe bluntly conical anteriorly becoming shorter, rounder, then progressively fusing with dorsal neuropodial lobe so that free part reduced to small tubercle in posterior setigers. Ventral cirrus almost or just reaching tip of ventral neuropodial lobe anteriorly, extending just beyond posteriorly. Acicula dark brown-black, yellowish brown at tip. For numbers and types of setae see Table 8. Shafts of falcigers (Fig. 8c) much thicker than spinigers, little change in thickness along body. Falciger appendages stout, moderately hooked, coarsely toothed basally and with barely discernable tendon near tip, becoming smaller posteriorly.

Anal cirri extend over last 8 setigers.

*Comments:* Additional variations not described for holotype include prostomium length 1–1.5 times width, longest tentacular cirri extending to setiger 3–6, occasionally 8. Paragnaths, I = 2–5 in vertical line or triangle; II = 6–16 in 2–3 oblique rows; III = 6–20 in square to rectangular patch; IV = 8–28 in 2–3 lines forming a transverse patch; V = 1–4 large and small cones arranged longitudinally; VI = 7–13 in oblique arc, variably discontinuous in some specimens; VII–VIII = 25–49 in band 2–4 deep, small cones rare and scattered. Dorsal cirri 2–6 times length of dorsal notopodial lobe anteriorly, 4–7 times posteriorly. Dorsal notopodial lobe reduced or absent in last few setigers. Dorsal elonga- and inflation of notopodium marked in all but very small individuals. Rounding of notopodial lobes in anterior setigers most pronounced in large specimens, not noticeable in small. Variation in numbers and types of setae shown in Table 8. Larger individuals generally with more setae.

*Discussion: Neanthes uniseriata* n.sp. belongs to the same group as *N. biseriata* n.sp. and *N. isolata* n.sp. in having only two well-developed notopodial lobes and paragnaths in all areas of the pharynx including a broad band of paragnaths in Areas VII–VIII. Within this group *N. cortezi* Kudenov, 1979, *N. noodti* Hartmann-Schröder, 1962, and *N. pseudonoodti* Fauchald, 1977*b* differ from

TABLE 8. *Setal counts for* Neanthes uniseriata *n.sp.*

| | No. of setae | | |
|---|---|---|---|
| | Setiger 10 | Setiger 30 | Setiger 63 |
| *Notosetae* | | | |
| homogomph spinigers | 8 (3–11)* | 7 (3–7) | 3 (2–6) |
| *Neurosetae* | | | |
| (i) Dorsal fascicle | | | |
| above—homogomph spinigers | 5 (2–5) | 5 (1–5) | 3 (1–5) |
| below—heterogomph falcigers | 3 (1–3) | 1 (1–3) | 2 (1–2) |
| (ii) Ventral fascicle | | | |
| above—heterogomph spinigers | 1 (1–2) | 2 (1–2) | 1 (0–2) |
| below—heterogomph falcigers | 8 (5–8) | 7 (2–7) | 4 (2–6) |

* Numbers in brackets refer to the variation in numbers of setae occurring in 9 paratypes.

*N. uniseriata* n.sp. in that in posterior setigers the dorsal notopodial lobe becomes extremely elongate and bears the dorsal cirrus at its tip. *Neanthes crucifera* (Grube, 1878), *N. macrocephala* (Hansen, 1882), and *N. willeyi* (Day, 1934) may be distinguished from *N. uniseriata* n.sp. by the small, oval patch of paragnaths in Area VI of the pharynx. *Neanthes larentukana* (Grube, 1881) and *N. vitabunda* (Pflugfelder, 1933) may be distinguished by the triangular arrangement of paragnaths in Area V. *Neanthes roosevelti* Hartman, 1939 differs by having about 20 small paragnaths bounded by 2 large paragnaths on each side in Area I plus differences in most other areas. *Neanthes augeneri* (Gravier & Dantan, 1934) differs in the arrangement of oral paragnaths and lacks neuropodial homogomph spinigers. Of the other Australian species, *Neanthes uniseriata* n.sp. may be distinguished from *N. isolata* n.sp. and *Neanthes vaalii* Kinberg, 1866 by the arrangement of oral paragnaths and reduction of the ventral neuropodial lobe, and from *Neanthes biseriata* n.sp. by the arrangement of oral paragnaths (see Key).

The specific name refers to the arrangement of paragnaths in Area VI of the complex.

*Distribution:* South Australia.

*Habitat:* In amongst algal holdfasts, coralline algae, crevice fauna, and in sand.

### *Neanthes vaalii* Kinberg

*Neanthes vaalii* Kinberg, 1866: 171. Day & Hutchings, 1979: 107 (Australian distribution and synonymies). Hartmann-Schröder, in press (for full synonymy). Hutchings & Rainer, 1979: 754.

*Material Examined:* S.A.—10B, 1 spec. (18308). 12C, 2 (18303). 13A, 1 (18305). 13B, 19 (18304). 14A, 2 (18309). 22B, 2 (18306). 29A, 7 (18307). (AHF N 6501a, 6504, 7631, 7613, 5315, 5316, 6492, 5757, 6483) for localities see Hartman (1954).

*Neanthes vaalii* N.S.W., Port Jackson, NHS, 546. HOLOTYPE: Typsaml 455 (SSM).

*Description:* Size range, 40 setigers, 4.5 mm length, 0.3 mm width, to 98 setigers, 64 mm length, 4.5 mm width. Pharynx with conical dark brown paragnaths in maxillary row sometimes reduced to minute domed flecks especially in II and IV. Paragnaths arranged as follows: I — 1–4 in longitudinal patch; II — 7–18 arranged in oblique patch of 3–4 horizontal or vertical rows; III — 17–34 in circular patch often with 1 or 2 at sides; IV — 24–41 arranged in transverse rectangular patch; V — 3 in a triangle, rarely only 1 or 2; VI — 3–5 cones in isolated group, rarely with an additional cone continuous with V; VII–VIII — 2 irregular rows of about 50–70 large and small cones, occasionally 3rd row present, extends onto VI.

Notosetae homogomph spinigers, reducing in number posteriorly. Neurosetae dorsally homogomph spinigers and heterogomph falcigers, ventrally heterogomph spinigers and falcigers. Heterogomph falcigers coarsely toothed with indistinct tendon. Pygidium conical, with anal cirri extending over last 5–18 segments.

*Comments:* Kinberg's type lacks a head and the specimen is in two pieces. The parapodia agree well with the South Australian material.

*Australian Distribution:* Western Australia (Geraldtown, Drummond Cove), South Australia, Tasmania, New South Wales (Careel Bay).

*Habitat:* Associated with *Zostera*, sand, mud and intertidal clumps of mussels.

## *Nereis* Linnaeus

Pharynx eversible with conical paragnaths on both oral and maxillary rings. Four pairs of tentacular cirri present. Parapodia biramous. Notosetae include homogomph spinigers and falcigers, the latter in median and posterior setigers; neurosetae include homo- and heterogomph spinigers and heterogomph falcigers.

Type species: *N. pelagica* Linnaeus

### **Nereis bifida** n.sp.

*Nereis jacksoni*.—Kott, 1951: 95–98, fig. 3a–r (in part). Hartman, 1954: 31, figs. 26–29 (in part). *Non* Kinberg.

*Nereis heterissonensis* Augener, 1913: 159–163, Pl. 3, fig. 52, text fig. 17 (in part).

HOLOTYPE: S.A.—04A (18533) 79 setigers, 27 mm length, 2.7 mm width. PARATYPES: 04A, 5 spec. (18358), 04A, 3 (AHF POLY 1351), 04A, 3 (BMNH 1982: 25–27), 04A, 3 (USNM 071534), 04B, 5 (18359), 06B (18360), 07A, 2 (18356), 07B, 16 (18357), 19A, 3 (18362), 20A, 10 (18369), 21A, 6 (18370), 22B, 4 (18373), 23A, 1 (18366), 24A, 1 (18372), 25A, 2 (18371), 27B, 72 (18365), 27C, 1 (18364), 30B, 2 (18367), 30D, 4 (18368), 32A, 2 (18363). Entire specimens range from 50 setigers, 6.6 mm length, 0.75 mm width to 84 setigers, 28 mm length, 2.2 mm width.

*Additional Material: Nereis jacksoni* W.A.—Aldritch's Cove, Nornalup, 72 spec. (6174 + 18534) coll. and id. Kott. Point Peron, Rottnest Is. 1 (18535) coll. and id. Kott. S.A.—Sellicks Beach.

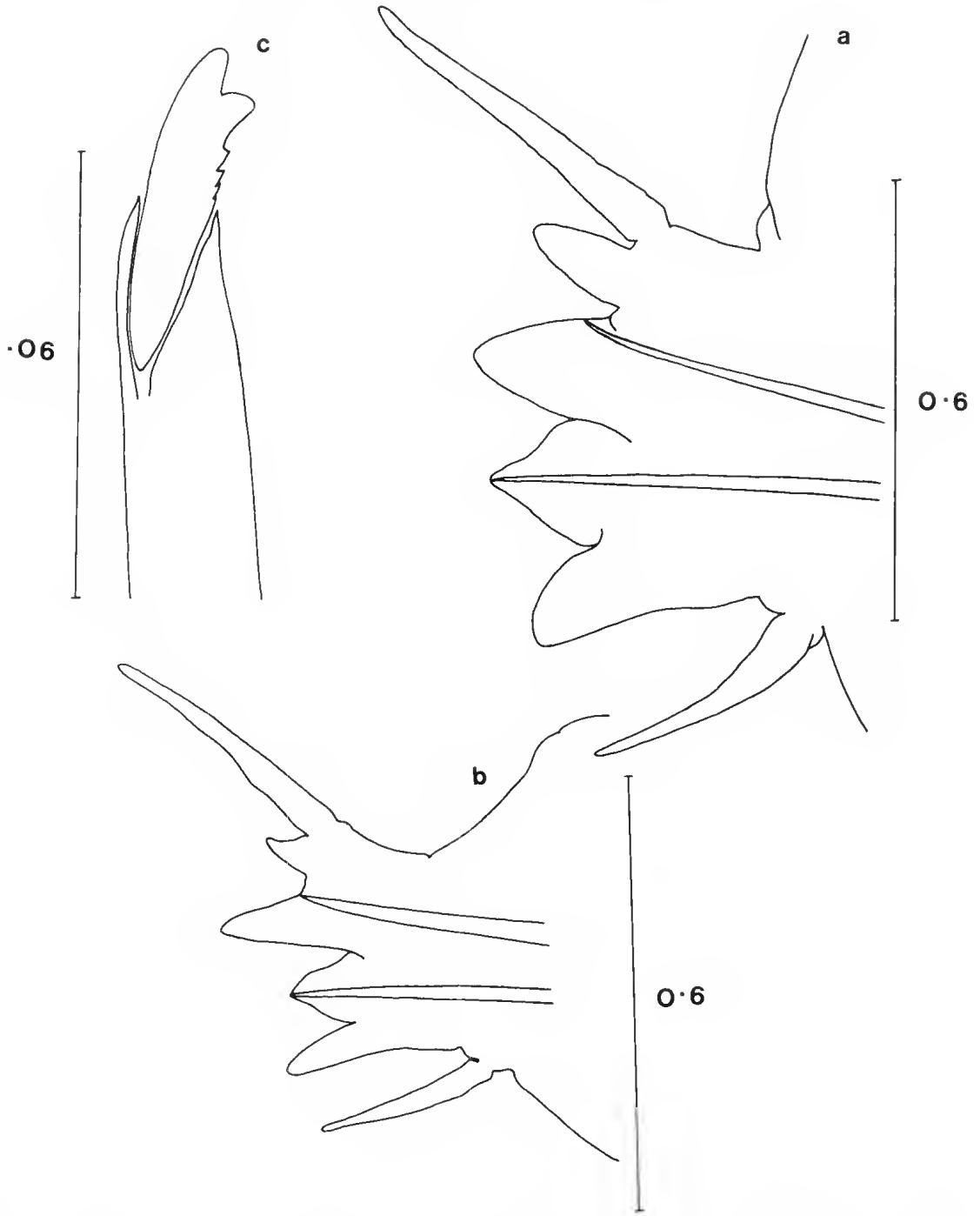


Fig. 9. *Nereis bifida* n.sp. a. anterior view of 8th parapodium. b. anterior view of 71st parapodium. c. notopodial homogomph faleiger from setiger 71. Scales in mm.

on edge of reef, permanently covered, 4 (AHF N7637), in part), coll. Hale, 1936, id. Hartman. 3 (AHF N7641, in part), coll. Hale, A18. Spencer Bay, dredged from 30 ft western shoal, 3 (AHF N7644, in part), coll. Sheard & Hale, Oct. 1938, A20.

*Nereis heitrissonensis:* W.A.—Albany, 10 spec. (HZM V7913 Typm.). Champion Bay, Geraldton, 1 (HZM V10085 Typm., in part).

*Description:* Elongate body, slightly flattened, colour brownish pink in alcohol. Prostomium as long as wide. Eyes blue-black, anterior pair slightly larger. Palps cylindrical, ventral length equal to first 2 setigers. One pair of antennae, 4 pairs tentacular cirri, longest extending to middle of setiger 3. Both antennae and tentacular cirri faintly, irregularly annulated. Pharynx with jaws basally almost straight, curved strongly at tips, yellowish-brown, with 6 teeth. Paragnaths dark brown, conical, arranged as follows: I = 0; II = 2 in oblique line; III = single minute cone; IV = 8 in irregular transverse band or oblique crescent; V = 0; VI = 1 on left, 2 on right very close together; VII–VIII = 4 widely spaced in single transverse row ventrally.

Dorsal cirrus 1.5–2 times length of ventral notopodial lobe anteriorly, elongating posteriorly to 2–2.5 times. Anterior parapodia (Fig. 9a) with ventral notopodial, dorsal and ventral neuropodial lobes similar in length or decreasing ventrally, posteriorly (Fig. 9b) with ventral notopodial lobe longest, dorsal and ventral neuropodial lobes similar. Dorsal notopodial lobe from setiger 3, small with maximum development at about setiger 10–12 then decreasing posteriorly to remain as small, pointed, conical lobe to end of body. Ventral cirrus anteriorly extending approximately to tip of ventral neuropodial lobe, posteriorly ⅔ to ¾ way to tip. Acicula dark brown with hyaline extremities. For numbers and types of setae see Table 9. Shafts of falcigers thicker than spinigers, becoming thicker posteriorly. Heterogomph falciger appendages anteriorly elongate, finely toothed with indistinct tendon, becoming more robust posteriorly. Homogomph falcigers (Fig. 9c) from setiger 18 with appendages robust, dark brown, terminal tooth and subterminal tooth very similar in size making appendage effectively bifid, variable number of much smaller teeth basally.

*Comments:* Additional variations not described for holotype include colour pale-dark pink or brown. Prostomium length 1–1.25 times width. Eyes blue-black to pale reddish, lenses distinct or indistinct. Palps equal to first 1.5–2.5 setigers ventrally. Longest tentacular cirri to setiger 3–4. Jaws with 6–8 teeth. Paragnaths pale and transparent to opaque black, generally dark brown, with II = 0–5, generally 2–4, always in single oblique line; III = 0, occasionally 1 small cone centrally; IV = 5–9, occasionally as few as 2; VI = 1, rarely 0 or 2–3 in close group; VII–VIII = 1–7, generally 3–5, always in single row. Dorsal cirrus elongating to 2–3 times length of ventral notopodial lobe posteriorly. Ventral neuropodial lobe as long as or slightly shorter than dorsal neuropodial lobe except in Kott's material (6174) where both ventral lobe and cirrus pressed up against dorsal neuropodial lobe rather than directed ventrolaterally, resulting in ventral lobe extending past dorsal. Ventral cirrus extending part way or just to tip of ventral neuropodial lobe in anterior and posterior setigers. Decrease in dorsal notopodial lobe commencing in anterior, middle or posterior setigers; lobe may be absent along much of body but always present albeit re-

TABLE 9. *Setal counts for* Nereis bifida *n.sp.*

| | No. of setae | | |
|---|---|---|---|
| | Setiger 8 | Setiger 30 | Setiger 71 |
| *Notosetae* | | | |
| homogomph spinigers | 6 (2–5)[1] | — | — |
| homogomph falcigers | — | 2 (1–2) | 2 (1–2) |
| *Neurosetae* | | | |
| (i) Dorsal fascicle | | | |
| above—homogomph spinigers | 5 (4–6) | 3 (2–3) | 1 (0–3) |
| below—heterogomph falcigers | 2 (1–3) | 1 (1–2) | 1 (1) |
| (ii) Ventral fascicle | | | |
| above—heterogomph spinigers | 5 (2–7) | 3 (1–3) | 0 (1–2) |
| below—heterogomph falcigers | 3 (2–3) | 2 (1–3) | 2 (0–2) |

[1] Numbers in brackets refer to the variation in numbers of setae occurring in 14 paratypes.

duced in anterior setigers, reduction generally occurring earlier and more completely in smaller individuals. Variation in numbers and types of setae shown in Table 9. Homogomph falcigers from setiger 16–19 in larger specimens to as early as setiger 11 in small specimens, appendage with small basal teeth present or absent, bifid form and dark coloration constant. Anal cirri extending over last 7–8 setigers.

Numerous specimens from Nornalup (6174 + 18534) in early stage of epitoky. Females with coelom full of large eggs (≤ 300 μ diameter), eyes on either side enlarged so as to be almost touching, postsetal neuropodial lobe variably inflated into small thick lamella in approximate range of setigers 19–33. Males with eyes as for females, postsetal neuropodial lobe variably produced as small, thick lamella in about setigers 15–50; some specimens with postsetal lobe becoming more plate-like and extensive and accessory natatory lobes present as a small rounded papilla at base of ventral cirrus of most epitokous paranodia; dorsal notopodial lobe decreasing rapidly from about setiger 50 to become absent with parallel basal inflation of dorsal cirrus. Setae as for atokes; natatory setae absent.

*Discussion:* This species includes part of Augener's type series for *Nereis heirissonensis*. It may be distinguished from *N. heirissonensis* Augener, 1913 (redescribed below p. 125) by the dentition of the notopodial homogomph falcigers, the presence of paragnaths in Area VI and generally greater numbers of paragnaths in other areas. Differences from similar species are given in Table 2.

The specific name refers to the bifid shape of the notopodial homogomph falcigers.

*Australian Distribution:* Western Australia, South Australia.

*Habitat:* Associated with algae and seagrass beds.

**Nereis cirriseta** n.sp.
FIG. 10a–d

*Nereis denhamensis*—Kott, 1951: 99–101, text figs. 3s–y, 4l–q (in part). *Non* Augener.

*Nereis jacksoni*—Kott, 1951: 95–98, text fig. 3a–r (in part). *Non* Kinberg.

HOLOTYPE: W.A.—Point Peron and Rottnest Is., stats 23, 31, 32, 61, 68, 72, 77 (18528) coll. and id. Kott as *N. denhamensis*, 79 setigers, 28.5 mm length, 2–4 mm width. PARATYPE: W.A.—Point Peron and Rottnest Is., stats 23, 31, 32, 61, 72, 77 (in part) 2 (18529); stats 14, 86 (in part), 1 (BMNH ZB 1982: 28) coll. and id. Kott as *N. denhamensis*. Stats 14, 40, 56, 68 (in part) 3 (18530), 1 (AHF POLY 1355) coll. and id. Kott as *N. jacksoni*. S.A.—Spencer Bay, dredged from 30 ft western shoal, 2 (AHF 7644, in part) coll. Sheard & Hale, A20, Oct. 3, 1938, id. Hartman as *N. jacksoni*, 04A, 6 (18532), 1 (USNM 071535), 21A, 1 (18531). Size range of paratypes 50 setigers, 9.5 mm length, 0.9 mm width to 68 setigers, 25 mm length, 1.4 mm width.

*Other Material Examined: Nereis calluona* var. *peroniensis* W.A.—Point Peron, stats 14, 23, 72, 74, 3 spec. (3707) coll. and id. Kott. Type series.

*Description:* Body elongate, flattened, brownish pink. Prostomium as long as wide. Eyes diffuse red, lenses distinct, posterior pair larger. Palps robust, cylindrical. One pair antennae, extending almost to tips of palps. Four pairs tentacular cirri, longest extending to middle of setiger 2. Both antennae and tentacular cirri closely, distinctly annulated.

Pharynx with jaws basally almost straight, sharply curved distally, transparent brown 7–8 teeth. Paragnaths conical, pale and transparent to dark brown, arranged as follows: I = 0; II = 7 in 2 oblique rows; III = 1 minute cone centrally; IV = 9–10 irregularly in oblique crescent; V = 0; VI = 5 in small oval patch; VII–VIII = 7 in single, evenly spaced transverse row.

Dorsal cirrus extending as far as or barely past ventral notopodial lobe in anterior setigers, elongating to 1.5–2 times length of lobe posteriorly. Dorsal notopodial lobe from setiger 3, similar in size to ventral notopodial lobe except absent in last setiger. Anterior parapodia (Fig. 10a) with ventral notopodial lobe extending furthest, neuropodial lobes similar to each other. Notopodium medial to dorsal cirrus becoming elongated, elevated and inflated posteriorly resulting in dorsal and ventral notopodial lobes extending similarly past neuropodial lobes (Fig. 10b). Ventral cirrus in anterior setigers extending ⅔ to ¾ to tip of ventral neuropodial lobe, reducing to ½ to ⅔ posteriorly. Acicula dark reddish-brown with hyaline tips. For numbers and types of setae see Table 10.

Notopodial homogomph falcigers (Fig. 10c–d) from setiger 20 (left)–22 (right), shaft brown, thick appendage pale, slender, tapering, slightly hooked, smooth except for up to several small bristle-like teeth basally, distal most bristles occasionally arising from apices of small serrate teeth. Appendage may appear smooth unless viewed from side and

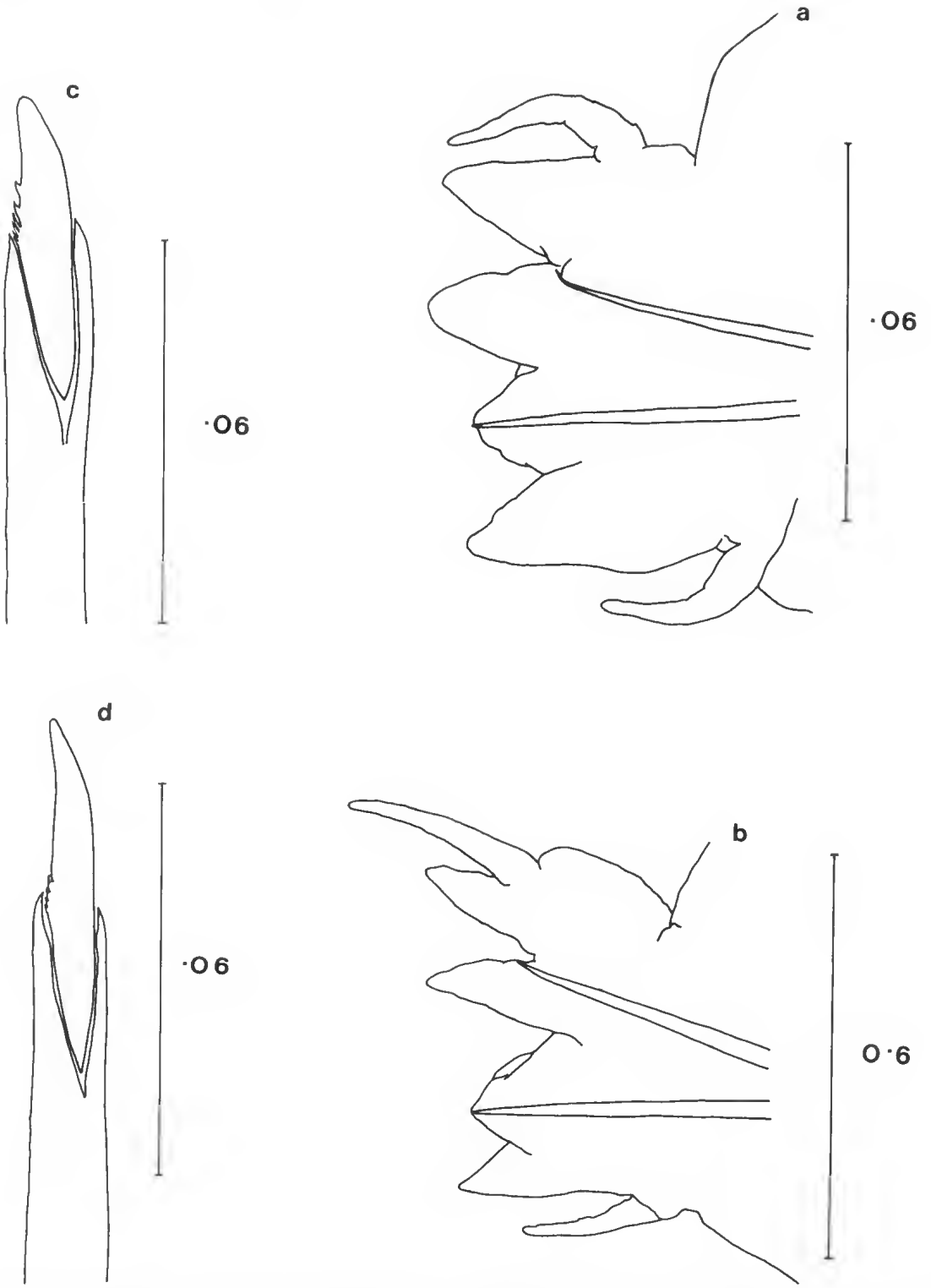


Fig. 10. *Nereis cirriseta* n.sp. a. anterior view of 11th parapodium. b. anterior view of 71st parapodium. c. notopodial homogomph falciger from setiger 37. d. notopodial homogomph falciger from setiger 74. Scales in mm.

TABLE 10. *Setal counts for* Nereis cirriseta *n.sp.*

| | No. of setae | | |
|---|---|---|---|
| | Setiger 11 | Setiger 37 | Setiger 71 |
| *Notosetae* | | | |
| homogomph spinigers | 6 (2–7)* | — | — |
| homogomph falcigers | — | 2 (2–3) | 1 (1–4) |
| *Neurosetae* | | | |
| (i) Dorsal fascicle | | | |
| above—homogomph spinigers | 10 (3–11) | 11 (2–15) | 7 (4–16) |
| below—heterogomph falcigers | 3 (2–4) | 2 (1–3) | 2 (1–2) |
| (ii) Ventral fascicle | | | |
| above—heterogomph spinigers | 6 (2–7) | 6 (0–10) | 5 (1–8) |
| below—heterogomph falcigers | 4 (2–5) | 2 (2–4) | 2 (2–3) |

* Numbers in brackets refer to the variation in numbers of setae occurring in 10 paratypes.

often appears short, stout, bluntly rounded when worn. Shafts of falcigers becoming thicker posteriorly. Appendages of heterogomph falcigers anteriorly elongate, finely toothed, tip long, slightly curved with indistinct tendon, becoming more robust posteriorly.

Anal cirri extend over last 6 setigers.

*Comments:* Variation includes prostomium length 1–1.25 times width, eyes diffuse bluish-dark blue-black with two pairs similar in size or anterior pair larger, lenses distinct or indistinct. Palps robust, cylindrical, globose or conical. Antennae extending almost to or well past tips of palps. Longest tentacular cirri extend to setiger 1–3. Jaws pale yellow basally, brown distally, with 6–8 teeth. Paragnaths arranged as follows: I = 0; II = 2–5 in 1 or more typically 2 oblique rows; III = 0, rarely 1 small cone; IV = 4–7 in an oblique crescent, rarely as few as 2 in very small specimens; V = 0; VI = 3–6 in oval patch or transverse row with one or two above and/or below, rarely 1–2; VII–VIII = 4–7 in evenly spaced transverse row ventrally. Dorsal cirrus extending almost to or slightly past ventral notopodial lobe, 1.5–2.5 times length of lobe posteriorly. Dorsal notopodial lobe initially small, attaining maximum size smaller than ventral notopodial lobe at about setiger 10–14 then decreasing gradually to disappear in last few setigers, reduction more noticeable in small specimens. Notopodium medial to dorsal cirrus not enlarged in small specimens. Other lobes variable in relative length except ventral notopodial lobe generally extending furthest. Ventral cirrus extending half to three-quarters way to tip of ventral neuropodial lobe. Numbers and types of setae shown in Table 10. Notopodial homogomph falcigers beginning earlier in small specimens, later in large, from setiger 15–40. Anal cirri extend over last 2–3 setigers.

*Discussion:* The notopodial homogomph falcigers and parapodial proportions of *Nereis cirriseta* n.sp. are very similar to those of *Nereis callaona* var. *peroniensis* Kott (3707). The pharynges of Kott's types for *N.c. peroniensis* are missing and the pharynx illustrated by Kott (1951, p. 99, text fig. 4a–b) differs from *N. cirriseta* n.sp. by having several paragnaths in Areas I and III. We have thus been unable to identify *N. cirriseta* n.sp. with Kott's species and consider that Kott's species *N. callaona* var. *peroniensis* is indeterminate based on the published description and the type material in its present condition. *Nereis cirriseta* n.sp. may be distinguished from similar species of *Nereis* using the characteristics given in Table 2.

The specific name refers to the elongate appendages of the notopodial falcigers.

*Australian Distribution:* Western Australia, South Australia.

*Habitat:* Rocky intertidal shores and subtidally to 10 m.

*Nereis cockburnensis* Augener
FIG. 4b

*Nereis cockburnensis* Augener, 1913: 153–156, pl. 3, fig. 47, text figs 15a–c. Hartman, 1954: 33, figs 30–32. Knox and Cameron, 1971: 28. Day, 1975: 191.

*Nereis (Neanthes) thompsoni* Kott, 1951: 103–105, text figs 5a–h.

*Material Examined:* S.A.—08A, 1 spec. (18354). 15A, 1 (18353). 16A, 9 (18355). 17A, 1 (18353). 20A, 8 (18344). 21A, 7 (18343). 23A, 34 (18345), 1 ♂ epitoke (18346). 30A 21 (18349), 1 ♂ epitoke (18392). 30B, 1 developing ♂ epitoke (18350). 30D, 11 (18347), 1 ♀ epitoke (18348). 32A, 18 (18351).

TABLE 2. *Comparison of* Nereis *species with sparsely, coarsely toothed notopodial falcigers and Areas VII–VIII of the pharynx with paragnaths in a narrow band, a single row, or absent.*

| | Prostomium | Paragnaths | Dorsal notopodial lobe | Falcigers | Distribution |
|---|---|---|---|---|---|
| *Nereis bifida* n. sp. | entire | absent on I, III and V or rarely a single cone on III; single row on VII–VIII | present anteriorly, decreasing posteriorly, sometimes to disappear | homo—terminal and subterminal tooth similar in size, variable number of much smaller teeth basally.<br>hetero—in both neuropodial fascicles anteriorly, single row of teeth | W.A., S.A. |
| *Nereis cirriseta* n. sp. | entire | absent on I and V; single row on VII–VIII | present anteriorly, constant or decreasing posteriorly, sometimes to disappear | homo — slender, slightly hooked smooth except for several small teeth basally.<br>hetero—in both neuropodial fascicles anteriorly, single row of teeth | S.W. W.A., S.A. |
| *N. denhamensis* Augener, 1913 | entire | absent on V only, rarely absent on I; single row on VII–VIII with a few additional cones | present anteriorly, increasing (large specs.), constant, or decreasing (small specs.) posteriorly, sometimes to disappear | homo—terminal teeth robust, large, lateral teeth generally much smaller.<br>hetero—in both neuropodial fascicles anteriorly, single row of teeth | W.A., S.A. |
| *N. falcaria* (Willey 1905) | frontal border deeply notched | absent on I and V–VIII | not shown | homo—terminal and subterminal tooth similar in size.<br>hetero—in both neuropodial fascicles anteriorly | Sri Lanka |
| *N. heirissonensis* Augener, 1913 | entire | absent I, III, V and VI; single row or absent on VII–VIII | present anteriorly, decreasing rapidly to disappear in middle and/or posterior setigers | homo—with large terminal tooth, smaller lateral teeth.<br>hetero—in both neuropodial fascicles anteriorly, single row of teeth | W.A. |
| *N. jacksoni* Kinberg, 1865 | entire | absent on I and V; narrow band of many cones on VII–VIII | notopodial lobes similar in size anteriorly, dorsal lobe becoming more slender in posterior setigers | homo—long tapering terminal tooth plus 2–4 smaller lateral teeth decreasing in size basally.<br>hetero—in both neuropodial fascicles anteriorly, single row of teeth | Port Jackson, Sydney, N.S.W. |

| | Prostomium | Paragnaths | Dorsal notopodial lobe | Falcigers | Distribution |
|---|---|---|---|---|---|
| *N. maxillodentata* n. sp. | entire | absent on I and V–VIII | present anteriorly, decreasing posteriorly, sometimes to disappear | homo—terminal and subterminal tooth similar in size, 3–4 much smaller teeth basally.<br>hetero—in both neuropodial fascicles anteriorly. single row of teeth | N.S.W., Qld |
| *N. ovarius* Read, 1980 | entire | pale and inconspicuous. absent on I, II and V in atokes; single row in VII–VIII. occasionally with 1–2 extra | present anteriorly, reduced to low papillae in middle and posterior setigers | homo—terminal and subterminal tooth similar in size, several much smaller teeth basally.<br>hetero—in both neuropodial fascicles anteriorly. single row of teeth | Wellington, New Zealand |
| *N. panamensis* Fauchald, 1977b | pentagonal with slightly bifid anterior margin | absent from I and V: single row in VII–VIII | absent | homo—terminal and subterminal tooth similar in size, sometimes 1 small tooth basally.<br>hetero—in both neuropodial fascicles. teeth in several transverse rows | Panama |
| *N. parabifida* n. sp. | entire | absent I and V: single row in VII–VIII | present anteriorly, decreasing posteriorly, sometimes to disappear | homo—short dark, subterminal and terminal tooth similar in size plus 1–3 smaller basal teeth.<br>hetero—in both neuropodial fascicles anteriorly. single row of teeth | S.A., N.S.W. |
| *N. spinigera* n. sp. | slightly indented between antennae | absent III and V, generally absent I; single row in VII–VIII or rarely absent | absent | homo—terminal and subterminal tooth similar in size plus up to several much smaller teeth basally.<br>hetero — replaced entirely by heterogomph spinigers in both neuropodial fascicles of many anterior parapodia, single row of teeth | S.A. |

*Nereis (Neanthes) thompsoni* W.A., Rottnest Is., Point Peron, and Aldritch's Cove, Nornalup. HOLOTYPE: (7035); many PARATYPES (6818), coll. and id. Kott.

*Description:* Size range 32 setigers, 4.9 mm length, 0.85 mm width to 69 setigers, 41 mm length, 4 mm width. Paragnath counts as follows, with Augener's (1913) figures in brackets: I = 1, rarely 0 to 2 (0); II = 8–13 down to 4 in very small individuals in 2 oblique rows, larger cones medially (8 in an oblique double row); III = 3–7 down to 1 cone in an oval patch or cross (2 in tandem); IV = 16–32 down to 6 cones in a transverse crescent of up to 4 rows (5–11 in a triangular patch of 2–3 rows); V = 0–19 cones in an irregular patch, membranous field of V very narrow and most cones in patch extending onto VI (6 in 2 rows in an oval patch); VI = 4 or 5, rarely as few as 2 or as many as 7, mainly very large cones with occasional small ones in a small patch (5 large cones in a circle or cross); VII and VIII forming a continuous band with 1–2 irregular rows of large and medium sized cones anteriorly, occasionally only represented by a few scattered cones, 5–12 deep ventrally and 2–4 deep laterally, which decrease in size posteriorly (a broad band of many cones, 5–7 deep and 2–4 deep at sides).

Notopodial homogomph falcigers present from setiger 3, with elongate appendage weakly hooked and finely toothed along most of the margin in anterior setigers; posteriorly darker, more robust, teeth stouter, fewer in number and progressively confined to the basal region of the appendage. Notopodial homogomph spinigers also occur anteriorly. Neurosetae homogomph spinigers and heterogomph falcigers dorsally and heterogomph spinigers and falcigers ventrally.

Male epitokes (18346, 18392) with setigers 1–14 unmodified except for basally inflated dorsal and ventral cirri in setigers 1–7 and 1–5 respectively. Setigers from 15th with flattened, fan-shaped accessory natatory lobes medially on bases of dorsal and ventral cirri and on postsetal margins of dorsal neuropodial lobes (Fig. 4b). Dorsal cirrus with large, rounded nodules along central two thirds of ventral surface. Notopodial and presetal neuropodial lobes flattened and blade-like. Ventral neuropodial lobe digitiform, constricted at base. Ventral cirrus with digitiform accessory natatory lobe extending dorsolaterally from base, $\frac{3}{8}$ of length of cirrus. All setae modified to paddle-shaped natatory type. Development of epitoky occurs gradually as shown by the developing male epitoke (18350), with partial development of accessory lobes and reduced numbers of atokous setae in addition to natatory setae.

*Comments:* Hartman (1954, p. 33) described an ovigerous female in the early stages of epitoky. Additional characteristics are provided by an ovigerous anterior fragment of 22 setigers (18348) with further but still incomplete development. Parapodia were as for males except dorsal cirri of first 5 and ventral cirri of first 4 setigers basally inflated, epitokous parapodia with smooth dorsal cirri, from setiger 17 as in Hartman but with both atokous and natatory setae emergent.

Paragnath counts are much more variable in our material than described by Augener (1913). Lengths of tentacular cirri also vary, the longest extending to setiger 4–8. The dorsal notopodial lobe may be reduced both anteriorly and posteriorly in small specimens, frequently becoming absent posteriorly, while in larger specimens such reductions may not occur or be confined to the last few setigers.

We have examined *Nereis (Neanthes) thompsoni* Kott and found it to be indistinguishable from our material. We have thus synonymised it with *N. cockburnensis* Augener.

*Australian Distribution:* Western Australia (Geraldtown), South Australia, Victoria and New South Wales.

*Habitat:* Associated with algae and encrusting fauna.

### *Nereis denhamensis* Augener
FIG. 11a–k

*Nereis denhamensis* Augener, 1913: 156–159, Pl. 3, fig. 51, text fig. 16a–b. Fauvel, 1917: 204–206, Pl. 6, fig. 45–46, text fig. 15a–d. Kott, 1951: 99–101, text figs 3s–y, 4l–q (in part). Hartman, 1954: 30–31.

*Nereis (Nereis) denhamensis.* — Hartmann-Schröder, 1980: 58–59, figs 47–55.

*Nereis jacksoni* — Hartmann-Schröder, 1979: 114–115. *Non* Kinberg.

*Nereis heirissonensis* Augener, 1913: 159–163, Pl. 3, fig. 52, text fig. 17 (in part).

*Material Examined:* W.A.—Shark Bay, 36 (HZM V7911, Typm.). Shark Bay, South Passage, 2 (HZM V10117, Typm.). Port Hedland, 1 (HZM P16569, in part). Tantabiddy Creek, Exmouth, 2 (HZM P16548, Greenough River, Geraldton, 3 (HZM P16547, in part). Unknown except West Australia, 2 (HZM P-E5061). Point Peron and Rottnest Is., stats 23, 31, 32, 61, 68, 72, 77 (in

part), 20 (18537); stat 68, 1 developing ♀ epitoke (18538); 2 developing ♂ epitokes (18539); stats 60 and 88, 3 (18540); stats 14 and 86 (in part), 1 (18541) coll. and id. Kott, S.A.—04A, 19 (18546), 04B, 5 (18547), 07A, 1 (18542), 07B, 26 (18543), 08A, 30 (18544), 19A, 1 (18545), 21A, 1 (18551), 23A, 1 (18550), 27A, 6 (18548), 27B, 1 (18549).

*Nereis heirissonensis* Western Australia—1 (HZM V10102 Typm., in part), Champion Bay, Geraldton, 4 (HZM V10085 Typm., in part), Shark Bay, 1 (HZM V7912 Typm., in part).

*Description:* Size range 31 setigers, 5.3 mm length, 0.45 mm width to 63 setigers, 47 mm length, 3 mm width. Prostomium about as long as wide, palps stout, tentacular cirri extending to setiger 2–4, shallowly but distinctly annulated. Jaws short, robust, yellow-brown at base, darker distally, 5–8 teeth. Paragnaths conical, pale to dark brown, arranged as follows: I = 1–3 in longitudinal series, rarely 0; II = 7–20 to as few as 5 in very small specimens, in 2–3 oblique rows; III = 7–24 to as few as 1, in triangular patch of 3–4 transverse rows; IV = 10–40 to as few as 5, in a transverse triangular patch; V = 0; VI = 5–15 to as few as 3, generally in a small transverse oval patch of 2–3 irregular rows; VII–VIII = 6–10 large cones forming a single, evenly spaced row with an additional 0–7 smaller cones scattered about large cones ventrally.

Parapodia with lobes bluntly rounded anteriorly (Fig. 11a), more noticeably in large specimens, becoming conical posteriorly (Fig. 11b). Dorsal cirrus 2–3 times length of ventral notopodial lobe anteriorly, 2–4 times posteriorly. Large specimens with dorsal notopodial lobe similar to or slightly smaller than ventral notopodial lobe anteriorly, similar or slightly larger posteriorly. Part of notopodium medial to dorsal cirrus becoming elongate, elevated and inflated in posterior setigers. In small specimens dorsal notopodial lobe frequently very strongly reduced in both posterior and far anterior setigers and may be absent posteriorly, with little or no dorsal enlargement of notopodium. Neuropodial lobes extending almost to or as far as notopodial lobes anteriorly, shorter posteriorly. Ventral cirrus extending two-thirds way to as far as tip of ventral neuropodial lobe. Notopodia with homogomph spinigers in anterior parapodia replaced by homogomph falcigers from setiger 15–22 or as early as setiger 11 in very small specimens, complete replacement occurring over about 1–12 setigers. Appendages of homogomph falcigers pale, stout, with terminal tooth large, slightly hooked, lateral teeth much smaller, about 1–4 in number, saw-like, frequently followed by hair-like teeth basally. Some specimens with first lateral tooth relatively large but not as large as terminal tooth unless latter is obviously worn. In such cases base of terminal tooth is much broader. Occasional small specimens with 2 lateral teeth similar in size to terminal tooth on appendages of most anterior homogomph falcigers, appendages normal posteriorly. Neuropodia dorsally with homogomph spinigers and heterogomph falcigers, ventrally with heterogomph spinigers and falcigers. Heterogomph falcigers becoming more robust posteriorly, appendage becoming shorter, broader, more strongly hooked, tendon less distinct, teeth finer and more confined basally.

Anal cirri extend over last 5–10 setigers.

*Discussion:* We found our material to be indistinguishable from that of Augener (1913) and Kott (1951). The above description has thus been derived from our material together with that of Augener and Kott. Augener did not mention the presence of heterogomph falcigers in the dorsal neuropodial fascicle, and neither Augener nor Kott noted variation in the development of paragnaths, parapodial lobes and notopodial homogomph falcigers as extreme as that indicated above. Augener's (1913, p. 158) comment that "an den vorderen Rudern mit dorsalen Grätenborsten ist die Spitze der ventralen Sicheln gedeckt" probably refers to the tendon at the tip of a heterogomph falciger, not to a hood as suggested by Hartman (1954, p. 31). Hoods were absent from the falcigers of Augener's type material.

*Nereis denhamensis* may be distinguished from other species of *Nereis* by the combination of notopodial falciger characteristics and paragnath pattern (Table 2).

*Australian Distribution:* Western Australia, South Australia.

*Habitat:* Among algae, seagrasses, sponges and rocks.

*Nereis heirissonensis* Augener (redescription)

FIG. 12a–g

*Nereis heirissonensis* Augener 1913: 159–163, fig. 17a–e (in part).

LECTOTYPE: W.A.—Shark Bay (V7912), 62 setigers, 11.5 mm length, 1.4 mm width, PARA-

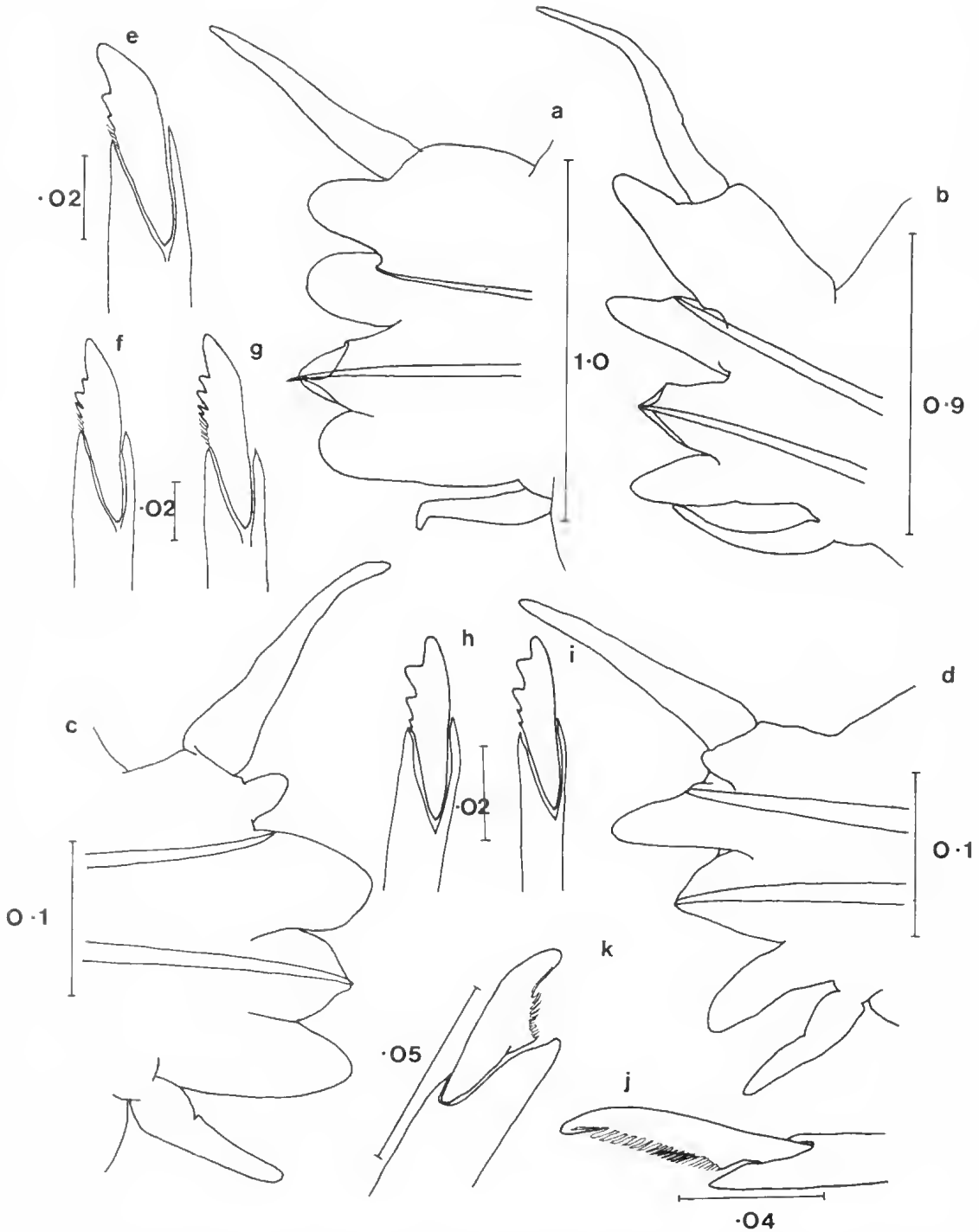


Fig. 11. *Nereis denhamensis* a. anterior view of 10th parapodium of large individual. b. anterior view of 58th parapodium of small individual. c. anterior view of tenth parapodium of small individual. d. anterior view of 32nd parapodium of small individual. e-g. range of typical notopodial homogomph falcigers. h-i. far anterior notopodial falcigers of small individual. j. anterior neuropodial falciger. k. posterior neuropodial falciger. Scales in mm.

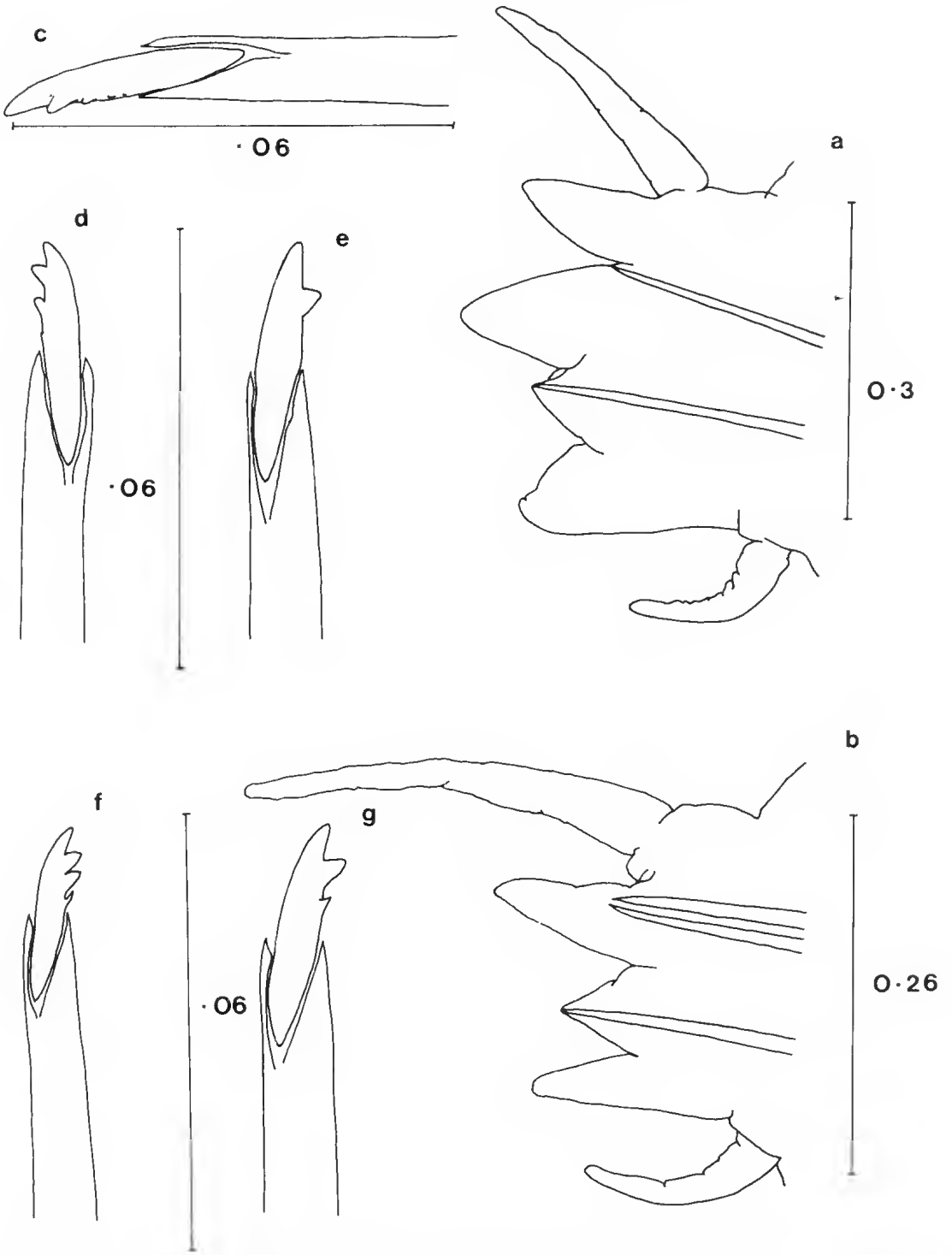


Fig. 12. *Nereis heirissonensis* a. anterior view of 9th parapodium. b. anterior view of 50th parapodium. c. notopodial homogomph falciger from setiger 50. d-g. some extreme variations in homogomph falciger dentition among paralectotypes. Scales in mm.

LECTOTYPES: Shark Bay (HZM V7912) range from 16.5 mm to 7.8 mm length, 1.4 mm to 0.9 mm width.

*Description:* Body elongate, flattened, colour in alcohol whitish becoming brownish anteriorly. Prostomium as long as wide. Eyes dark purple, anterior pair larger with distinct lenses. Palps small, stout, ventral length equal to first 2 setigers. One pair of antennae, extending slightly past palps. Four pairs tentacular cirri, longest extending to posterior margin of setiger 4. Antennae and tentacular cirri faintly, irregularly annulated. Pharynx with elongate, transparent yellow jaws, darker at tips, basally almost straight then curved strongly at tips, with 8 teeth. Paragnaths small, conical, transparent, colourless to faint reddish, arranged as follows: I = 0; II = 1; III = 0; IV = 3 in short, oblique row; V = 0; VI = 0; VII–VIII = 1 mid ventrally.

Dorsal cirrus extending slightly past ventral notopodial lobe anteriorly, elongating to twice length of lobe in far posterior. Notopodial and ventral neuropodial lobes conical, dorsal neuropodial lobe flattened, becoming more pointed posteriorly. Dorsal notopodial lobe slightly smaller than ventral in setigers 3–11 (Fig. 12a), then decreasing rapidly to disappear by setiger 19 (Fig. 12b). Notopodial presetal lobe absent. Ventral notopodial lobe longest. Dorsal neuropodial lobe equal to or shorter than ventral neuropodial lobe. Ventral cirrus extending about two-thirds of the way to tip of ventral neuropodial lobe. Acicula reddish-brown. Occasional parapodia with 2 notopodial acicula. For numbers and types of setae see Table 11. Shafts of falcigers thicker than spinigers, becoming thicker posteriorly. Heterogomph falciger appendages elongate, finely toothed, tip slightly curved with indistinct tendon. Homogomph falcigers from setiger 17 with appendages robust, not coloured with large terminal tooth and smaller lateral teeth decreasing in size basally (Fig. 12d–g).

Anal cirri extend over 7 setigers.

*Comments:* Additional variations not described for lectotype include notopodial and ventral neuropodial lobes with or without reddish pigment becoming more intense posteriorly, Prostomium length 1–1.25 times width. Eyes blue-black, both pairs of similar size, lenses indistinct. Antennae extend to level with palps. Palps equal to first 1.5–2 setigers ventrally. Longest tentacular cirri extending to posterior margin of setiger 2–4. Jaws with 7–9 teeth. Paragnaths in II = 1 or 0; IV = 0–5, generally 2–3 in small oblique group; VII–VIII = 0–3, generally 1–3, widely spaced in single line ventrally. Dorsal cirrus elongating in middle or posterior setigers to 2–2.5 times ventral neuropodial lobe. Dorsal notopodial lobe may be slightly to strongly reduced in the first few setigers following setiger 2, maximum size attained may be only one half that of ventral notopodial lobe before decreasing from setiger 10–14 to disappear by setiger 14–29. Lobe may sometimes remain as small rounded papilla at base of dorsal cirrus before disappearing entirely in far posterior parapodia. Smaller specimens with tendency towards relatively small dorsal notopodial lobes undergoing earlier and more complete reduction. Variation in numbers and types of setae shown in Table 11. Homogomph falcigers from setiger 16–19, appendages with variable development of lateral teeth (examples of variation shown in Figs. 12d–g) but only rarely with most distal lateral tooth approximately equal with terminal tooth. In such cases terminal tooth worn and

TABLE 11. *Setal counts for* Nereis heirissonensis

| | No. of setae | | |
|---|---|---|---|
| | Setiger 9 | Setiger 31 | Setiger 50 |
| *Notosetae* | | | |
| homogomph spinigers | 4 (2–4)* | — | — |
| homogomph falcigers | — | 2 (1–2) | 1 (1–2) |
| *Neurosetae* | | | |
| (i) Dorsal fascicle | | | |
| above—homogomph spinigers | 5 (2–7) | 1 (1–4) | 2 (0–3) |
| below—heterogomph falcigers | 3 (1–3) | 1 (1) | 1 (0–2) |
| (ii) Ventral fascicle | | | |
| above—heterogomph spinigers | 3 (1–4) | 4 (1–2) | 1 (0–3) |
| below—heterogomph falcigers | 4 (2–4) | 2 (1–2) | 2 (1–2) |

* Numbers in brackets refer to the variation in numbers of setae occurring in 10 paratypes.

generally more than one large lateral tooth present. Anal cirri extending over last 5–8 setigers.

*Discussion:* Augener (1913) described *Nereis heirissonensis* from a series of specimens which was found to include the above species together with another species (*Nereis bifida* n.sp. see p. 116) and several specimens of *N. denhamensis*. Augener stated that the homogomph falcigers of *N. heirissonensis* were similar to those of *N. denhamensis* Augener, 1913. This applies to the above material but not to *N. bifida* n.sp. while the rest of Augener's description fits either species with the exception of variation in paragnaths. We have thus designated a lectotype and paralectotypes and redescribed *N. heirissonensis* for the part of Augener's material with notopodial falcigers similar to *N. denhamensis* and erected *N. bifida* n.sp. for the other material.

*Nereis heirissonensis* may be distinguished from similar species of *Nereis* using the characteristics given in Table 2. The re-establishment of *N. heirissonensis* Augener as a valid species contradicts Fauchald (1977b) who suggests that there is general agreement that *N. heirissonensis* is synonymous with *N. jacksoni* Kinberg. As we demonstrate in the Discussion of *N. jacksoni* (p. 130) this species has been widely confused.

*Australian Distribution:* Western Australia.

*Habitat:* Dredged from shallow water.

*Nereis jacksoni* Kinberg (redescription)

FIG. 13a–c

*Nereis jacksoni* Kinberg, 1866: 169. Augener, 1922: 18–19. *Non* Augener, 1924: 319. Kott, 1951: 95–98, or Hartman, 1954: 31, figs 26–29.

HOLOTYPE: N.S.W.—Port Jackson (SSM Typ. No. 468), id. Kinberg.

*Description:* Two cut fragments in separate vials. One anterior fragment with everted pharynx, of 9 setigers, total length 5.5 mm, max. width of 2.1 mm at setiger 6. Other fragment from mid-section of same worm or one of similar size, probably continuous with anterior fragment with omission of 1 or 2 setigers between, consisting of 43 setigers, approx. max. width of 1.9 mm at 6th setiger of fragment, length about 18 mm. Far posterior section missing, many setae broken off.

Body elongate, pale yellow-white. Prostomium as long as wide. Eyes blue-black, anterior pair slightly larger and with distinct

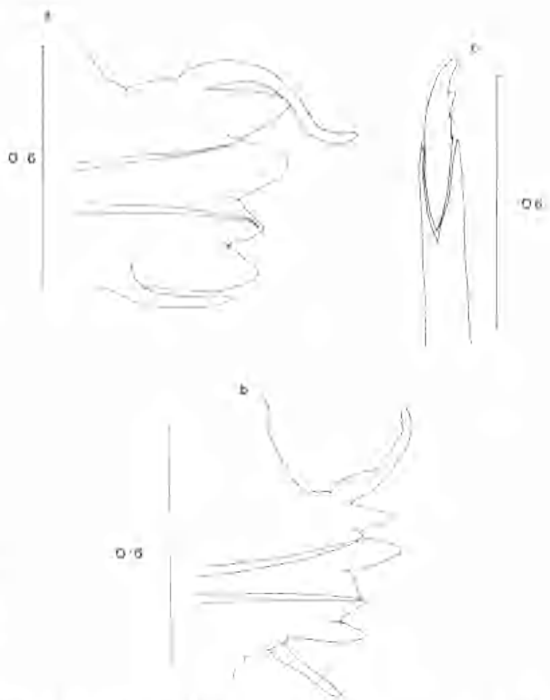


Fig. 13. *Nereis jacksoni* a, anterior view of 9th parapodium. b, anterior view of 40th parapodium. c, notopodial homogomph falciger from 38th setiger of posterior fragment. Scales in mm.

lenses, lenses of posterior pair indistinct. Palps conical, tapering rapidly from base, ventral length equal to first 1.5 setigers. One pair antennae, extending to level with palps. Four pairs tentacular cirri, longest pair distally incomplete, extending to anterior margin of setiger 2. Antennae and palps variably smooth to faintly, irregularly annulated. Pharynx with right jaw lost, left transparent brown, basally almost straight then slightly curved distally but apex missing, with 9 teeth. Paragnaths conical, transparent, pale brown to colourless, arranged as follows: I = 0; II = 6 (right)–8 (left) in oblique double row, irregular on right; III = 5 in single transverse row; IV = 12 (left) in oblique patch tapering towards jaws, damaged on right where jaw removed; V = 0; VI = 2 (right) 4 (left) in close group; VII–VIII = approx. 40–45 large and small cones in continuous, narrow, irregular band 1–2 deep except mid-ventrally where 2–3 deep with single, very large cone, 3–4 times size of any others, at anterior apex of mid-ventral spread.

Dorsal cirrus in anterior fragment 1.5–2 times length of ventral notopodial lobe, in

TABLE 12. *Setal counts for* Nereis jacksoni

| | No. of setae | |
|---|---|---|
| | Setiger 9 | Setiger 31 of posterior fragment |
| *Notosetae* | | |
| homogomph spinigers | 5 | — |
| homogomph falcigers | | 3 |
| *Neurosetae* | | |
| (i) Dorsal fascicle | | |
| above—homogomph spinigers | 1 | 3 |
| below—heterogomph falcigers | 4 | 2 |
| (ii) Ventral fascicle | | |
| above—heterogomph spinigers | 6 | 4 |
| below—heterogomph falcigers | 5 | 2 |

posterior fragment 2–3 times length of lobe. Parapodial lobes conical. Anterior fragment with notopodial lobes similar in size, longer than neuropodial lobes, ventral neuropodial lobe slightly longer than or similar to dorsal neuropodial lobe (Fig. 13a). Posterior fragment with parapodial lobes similar to anterior fragment except dorsal notopodial lobe becoming more slender in last few setigers (Fig. 13b). Ventral cirrus extending almost to or just to tip of ventral neuropodial lobe in anterior fragment, barely longer in posterior fragment. Acicula reddish-brown, pale at tips. For numbers and types of setae see Table 12. Homogomph falcigers robust, pale, from 10th setiger of posterior fragment, appendages elongate, curved, with long, tapering terminal tooth, most distal lateral tooth much smaller followed by 2–4 smaller teeth decreasing in size basally. Heterogomph falcigers with shafts becoming much thicker posteriorly appendages anteriorly elongate, finely toothed along most of border, tip slightly hooked with indistinct tendon, becoming relatively shorter, broader, slightly more strongly hooked posteriorly, tendon more distinct, teeth slightly more confined basally (Fig. 13c). Spinigers typical.

*Comments:* Kinberg's description is extremely brief. It does not include details of setae or parapodia while the description of paragnaths is inadequate, indicating only that paragnaths are absent in Areas I and V and continuous through VII–VIII. When Augener (1922) examined Kinberg's material of *N. jacksoni* he found two tubes, one containing a single specimen posteriorly incomplete but otherwise in good condition, the other containing two specimens in very poor condition. His description was based on the single specimen. On the basis of length, number of setigers and most other characters this is almost certainly the specimen we have examined. Augener's description differs from ours in that he did not observe the paragnaths in Area III or give full details of paragnaths in VII–VIII. He did not find homogomph spinigers in the dorsal neuropodial fascicle of posterior parapodia. In our examination these were intact in only a few of the posterior setigers, the remainder of the posterior neurosetae being damaged beyond identification. The notopodial homogomph falcigers have a terminal tooth which is more elongate and curved and may have more lateral teeth than indicated by Augener (1922).

*Discussion:* We examined material identified as *Nereis jacksoni* by Augener (1924), Kott (1951) and Hartman (1954) and as none of this material resembles *N. jacksoni* Kinberg we have referred it to a variety of species (see Australian species in Table 2). We also suggest that the numerous references to *N. jacksoni* from Australia and New Zealand quoted by Day & Hutchings (1979) and by Hartmann-Schröder (1980) may not be conspecific. All such material should be rechecked. Examination of a wide range of nereid material in the Australian Museum collection from N.S.W., including Port Jackson, has failed to find additional specimens of *N. jacksoni*.

*Australian Distribution:* New South Wales (Port Jackson).

*Habitat:* Rocky intertidal shores.

### **Nereis maxillodentata** n.sp.

FIG. 14a–c

*Nereis jacksoni*.—Augener, 1927: 130–133. Hartman, 1954: 31, text figs 26–29 (in part). *Non* Kinberg.

*Nereis denhamensis*.—Hartman, 1954: 30–31 (in part). *Non* Augener.

HOLOTYPE: N.S.W.—La Perouse, among weeds and mussels, sub-tidal (18527) pres. Bennett, 24.10.1962, 77 setigers, 34 mm length, 2.4 mm width. PARATYPES: N.S.W.—La Perouse, among weeds and mussels, sub-tidal, 1 spec. (4790) pres. Bennett, 24.10.1962. Hungry Bay, 2 (4800). Port Jackson, 2 (4802), 3 (4803). Malabar, Sydney, 28 m, CA5 Shipek (Grab), 1 (6282); Long Reef, Collaroy, 125 ft, 2 (6283); North Head, Sydney, 65 ft, 2 (6285), 2 (6287), 1 (6290), 2 (6288), 1 (6286), 1 (BMNH ZB 1982: 29), 1 (USNM 07156) coll. Shelf Benthic Survey 1972–73. Cronulla, 4 (AHF N6293) coll. Dew. Hungry Point, Cronulla, under rocks, 2 (AHF

N6472) coll. Dew, Nov. 1950, id. Hartman as *Nereis jacksoni*. Westernport Bay, Victoria, 2 (HZM V9535), id. Augener as *Nereis jacksoni*.

*Description:* Body elongate, slightly flattened colour brownish pink in alcohol. Prostomium as long as wide. Eyes red with distinct lenses, anterior pair slightly larger. Palps conical, tapering rapidly from broad base, ventral length equal to first 2 setigers. One pair antennae reaching almost to tips of palps. Four pairs tentacular cirri, longest extending to middle of setiger 3. Both antennae and tentacular cirri closely, distinctly annulated. Pharynx with transparent brown jaws, basally almost straight then curved strongly at tips with 7 teeth. Paragnaths dark brown, conical, arranged as follows: I = 0; II = 5 (left)–6 (right in double oblique row with larger cones medially; III = 4 in single transverse row; IV = 8 (left)–10 (right) irregularly arranged in elongate, oblique triangular patch; oral ring bare.

Dorsal cirrus 1.5–2 times length of ventral notopodial lobe in anterior setigers, increasing to 2.5–3 times length of lobe posteriorly. Parapodial lobes conical (Fig. 14a), more pointed posteriorly (Fig. 14b). Dorsal notopodial lobe from setiger 3, slightly smaller than ventral notopodial lobe in anterior setigers then decreasing from about setiger 15 to remain as small conical lobe except absent from last 2 setigers. Anterior parapodia with ventral notopodial lobe longest, dorsal and ventral neuropodial lobes shorter, about equal to each other. Posterior parapodia with notopodium becoming basally more elongate, ventral notopodial lobe extending well past neuropodial lobes, ventral neuropodial lobe longer than dorsal. Ventral cirrus extending two-thirds way to tip of ventral neuropodial lobe anteriorly, three-quarters way to or reaching tip of lobe posteriorly. Acicula dark brown, pale at tips. For numbers and types of setae see Table 13. Heterogomph falcigers becoming much thicker and darker posteriorly anteriorly with appendages elongate, finely toothed over most of length, tip weakly hooked with distinct tendon, posteriorly becoming more robust, teeth more confined basally, tendon indistinct. Homogomph falcigers from setiger 18, appendages initially pale then rapidly becoming dark brown with large

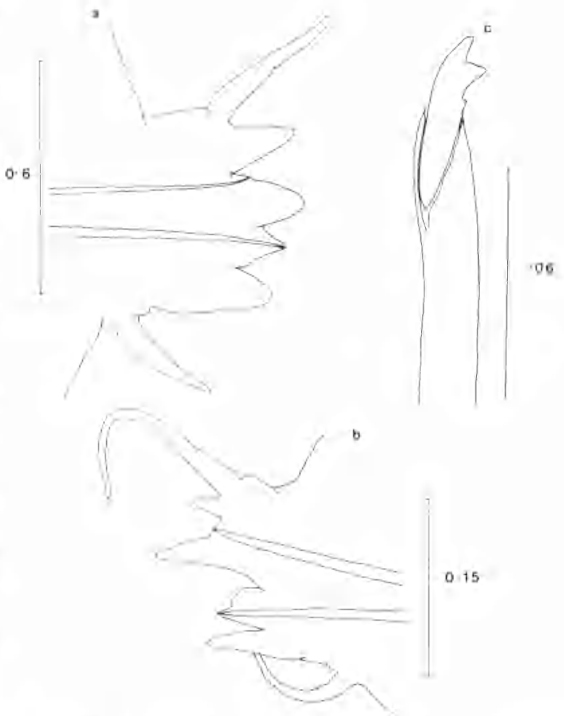


Fig. 14. *Nereis maxillodentata* n.sp. a. anterior view of 10th parapodium. b. anterior view of 66th parapodium. c. notopodial homogomph falciger from setiger 66. Scales in mm.

TABLE 13. *Setal counts for* Nereis maxillodentata *n.sp.*

| | No. of setae | | |
|---|---|---|---|
| | Setiger 10 | Setiger 37 | Setiger 66 |
| *Notosetae* | | | |
| homogomph spinigers | 5 (3–8)* | — | — |
| homogomph falcigers | — | 2 (2–3) | 2 (1–3) |
| *Neurosetae* | | | |
| (i) Dorsal fascicle | | | |
| above—homogomph spinigers | 5 (3–8) | 6 (2–8) | 3 (1–7) |
| below—heterogomph falcigers | 1 (1–5) | 1 (1–2) | 1 (1–2) |
| (ii) Ventral fascicle | | | |
| above—heterogomph spinigers | 5 (2–9) | 4 (2–8) | 2 (1–5) |
| below—heterogomph falcigers | 3 (2–7) | 2 (2–3) | 1 (1–3) |

* Numbers in brackets refer to the variation in numbers of setae occurring in 10 paratypes.

subterminal tooth similar in size to terminal tooth making appendage effectively bifid, up to 3–4 much smaller teeth frequently present basally (Fig. 14c).

Anal cirri extend over last 6 setigers.

*Comments:* Additional variations not described for holotype include colour white to greenish brown. Prostomium length 1–1.25 times width. Eyes red to blue black, lenses distinct or indistinct. Palps equal to first 1.5–2.5 setigers ventrally. Longest tentacular cirri extend to setiger 2–4. Jaws with 6–8 teeth. Paragnaths pale and transparent to dark. I = 0; II = 3–7 as for holotype or, when few, in single oblique line or inverted L; III = 2–4, in small specimens rarely 1 or occasionally not visible; IV = 4–11 in oblique variable patch, frequently triangular. Large specimens with parapodial lobes bluntly rounded anteriorly, conical posteriorly, dorsal notopodial lobe anteriorly varying from slightly smaller to slightly larger than ventral, decreasing from setiger 15–18 to remain as small conical lobe or disappearing in far posterior, notopodium medial to dorsal cirrus sometimes becoming dorsally inflated and slightly elongated in posterior setigers. Dorsal neuropodial lobe very short and blunt in some specimens. In small specimens dorsal notopodial lobe small in about setigers 5–12 and strongly reduced to absent elsewhere. Numbers and types of setae shown in Table 13. Homogomph falcigers from setiger 18 in large specimens to as early as 16 in smaller specimens. Anal cirri extend over last 6–11 setigers.

*Discussion:* This species has been confused by Augener (1924) and Hartman (1954) with *Nereis jacksoni* Kinberg. *Nereis maxillodentata* n.sp. can be distinguished by the characteristics in Table 2. This species which does not occur in S.A. has been described to clarify the species *Nereis jacksoni*.

The specific name refers to the presence of paragnaths only on the maxillary ring of the pharynx.

*Australian Distribution:* New South Wales (Sydney environs), Queensland (Port Molle).

*Habitat:* Subtidally in amongst algae, mussels, rocks and sediment.

**Nereis parabifida** n.sp.

FIG. 15a–c

*Nereis jacksoni*.—Hartman, 1954: 31, figs 26–19 in part). *Non* Kinberg.

HOLOTYPE: N.S.W.—Sydney, 36 ft (18511) coll. Shelf Benthic Survey, 26.11.1973, Posteriorly incomplete, 53 setigers, 19 mm length, 1.8 mm width. PARATYPES: S.A.—30B, 1 (18512), N.S.W.—Sydney, 36 ft, 2 (6284) coll. Shelf Benthic Survey, 26.1.1973. Camp Cove, Port Jackson, dredged in 3–4 fms, grilly bottom, 5 (AHF N6450), coll. Dew, id. Hartman as *Nereis jacksoni*, Middleton Reef, 30–40 fms, dredged, 1 (4804) coll. MacIntyre, C.S.I.R.O. Fisheries. Size range of entire paratypes 58 setigers, 11 mm length, 1.4 mm width to 67 setigers, 16 mm length, 1.4 mm width. Posteriorly incomplete specimens down to 1.0 mm width.

*Description:* Body slender, slightly flattened, yellow-white in alcohol, brown pigment in notopodial and ventral neuropodial lobes becoming more intense posteriorly. Prostomium length 1.25 times width. Eyes dark purple, anterior pair larger, lenses distinct. Palps short, stout, styles globose, length equal to first 1.5 setigers ventrally. One pair antennae extending to level with palps. Four pairs tentacular cirri, longest extending to middle of setiger 2. Both antennae and tentacular cirri faintly irregularly annulated. Pharynx with short, stout, transparent brown jaws curving slightly more sharply towards tips, with 8 teeth. Paragnaths pale brown cones, arranged as follows: I = 0; II = 4 in irregular, oblique single row; III = 4 in single transverse row; IV = 7 in transverse oval patch; V = 0; VI = 1; VII–VIII = 3 in single row mid-ventrally.

Dorsal cirrus extends to level with or slightly past ventral notopodial lobe in first few setigers, elongating to 1.5–2 times length of lobe in rest of body. Anterior setigers with notopodial and ventral neuropodial lobes bluntly conical (Fig. 15a), dorsal neuropodial lobe short, thick, blunt, lobes becoming more pointed posteriorly. Dorsal notopodial lobe from setiger 3, attaining maximum development by setiger 8–10 then decreasing rapidly to remain as a small elongate lobe to last setiger present in holotype (Fig. 10b). Of other lobes, ventral notopodial lobe longest, ventral neuropodial lobe generally longer than dorsal. Ventral cirrus extending two-thirds to three-quarters way to tip of ventral neuropodial lobe. Acicula dark brown-black, hyaline at tips. For numbers and types of setae see Table 14. Heterogomph falcigers with shafts slightly thicker than spinigers anteriorly, becoming much thicker posteriorly; appendages anteriorly slender, toothed along most of margin, tip moderately hooked with indistinct tendon, posteriorly becoming much broader

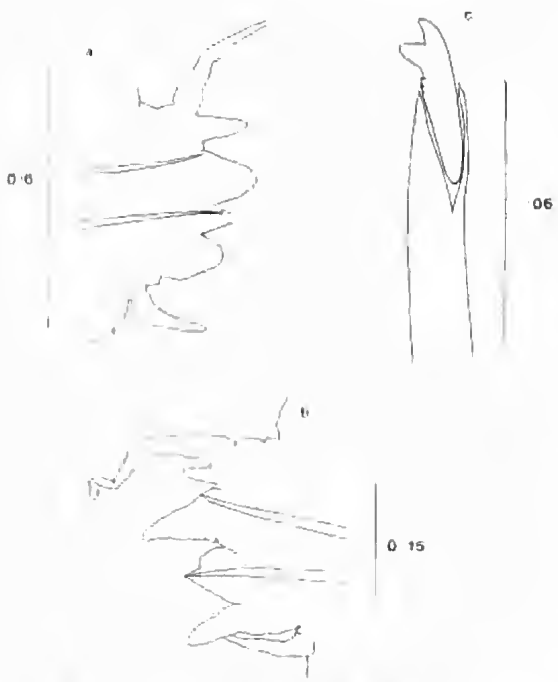


Fig. 15. *Nereis parabifida* n.sp. a. anterior view of 10th parapodium. b. anterior view of 44th parapodium. c. notopodial homogomph falciger from setiger 44. Scales in mm.

and more strongly hooked with teeth more basally confined. Homogomph falcigers from setiger 16 with thick shafts, appendages short, robust, dark, subterminal tooth as large as or slightly larger than terminal tooth, 1–3 much smaller teeth frequently present basally (Fig. 15c).

*Comments.* Variations not described for holotype include colour pale yellow-pink, prostomium length 1–1.25 times width. Antennae extending slightly past palps. Longest tentacular cirri extending to setiger 2–6. Jaws with 6–8 teeth. Paragnaths in II = 2–9 in single, irregular oblique row of frequently 2 parallel oblique rows; III = 3–5 in single transverse row; IV = 7–10 in transverse or oblique oval patch or crescent; VI = generally 2–4 in close group, rarely 1; VII–VIII = 3–5 in single row mid-ventrally. Dorsal cirrus elongating to 2–3 times length of ventral notopodial lobe in far posterior setigers of intact specimens. Dorsal notopodial lobe may be strongly reduced anteriorly, may not appear until as late as setiger 6, and may disappear in middle or posterior setigers. Ventral cirrus extending three-quarters of the way or just to tip of ventral neuropodial lobe in far posterior setigers. Numbers and types of setae shown in Table 14. Anal cirri extend over last 5–7 setigers.

*Discussion: Nereis parabifida* n.sp. can be distinguished from similar species of *Nereis* using the characteristics shown in Table 2.

The specific name refers to the similarity of this species to *N. bifida* n.sp.

*Australian Distribution:* South Australia (Kangaroo Island), New South Wales (Sydney, Lord Howe Island).

*Habitat:* Sub-tidal sediment (New South Wales), single specimen from intertidal algae (Kangaroo Island).

**Nereis spinigera** n.sp.

FIG. 16a–e

HOLOTYPE: S.A.—27C (18408) 68 setigers, 16.5 mm length, 1.1 mm width. PARATYPES: 04A, 1 (AHF POLY 1356), 11A, 1 (BMNH ZB 1982: 30), 19B, 1 (USNM 073014), 02A, 3 (18416), 04A, 7 (18411), 11A, 5 (18412), 13A, 3 (18361), 19A, 15 (18414), 19B, 1 (18413), 22A, 2 (18415), 22B, 1 (18410), 27C, 2 (18409).

TABLE 14. *Setal counts for* Nereis parabifida *n.sp.*

| | No. of setae | | |
|---|---|---|---|
| | Setiger 10 | Setiger 23 | Setiger 44 |
| *Notosetae* | | | |
| homogomph spinigers | 5 (2–5)* | — | — |
| homogomph falcigers | — | 2 (1–2) | 1 (1–2) |
| *Neurosetae* | | | |
| (i) Dorsal fascicle | | | |
| above—homogomph spinigers | 6 (3–5) | 2 (2–4) | 2 (3–4) |
| below—heterogomph falcigers | 2 (2–3) | 2 (1–2) | 1 (1) |
| (ii) Ventral fascicle | | | |
| above—heterogomph spinigers | 3 (2–3) | 5 (1–3) | 4 (0–2) |
| below—heterogomph falcigers | 6 (2–4) | 2 (1–2) | 1 (1–2) |

* Numbers in brackets refer to the variation in numbers of setae occurring in 5 paratypes.

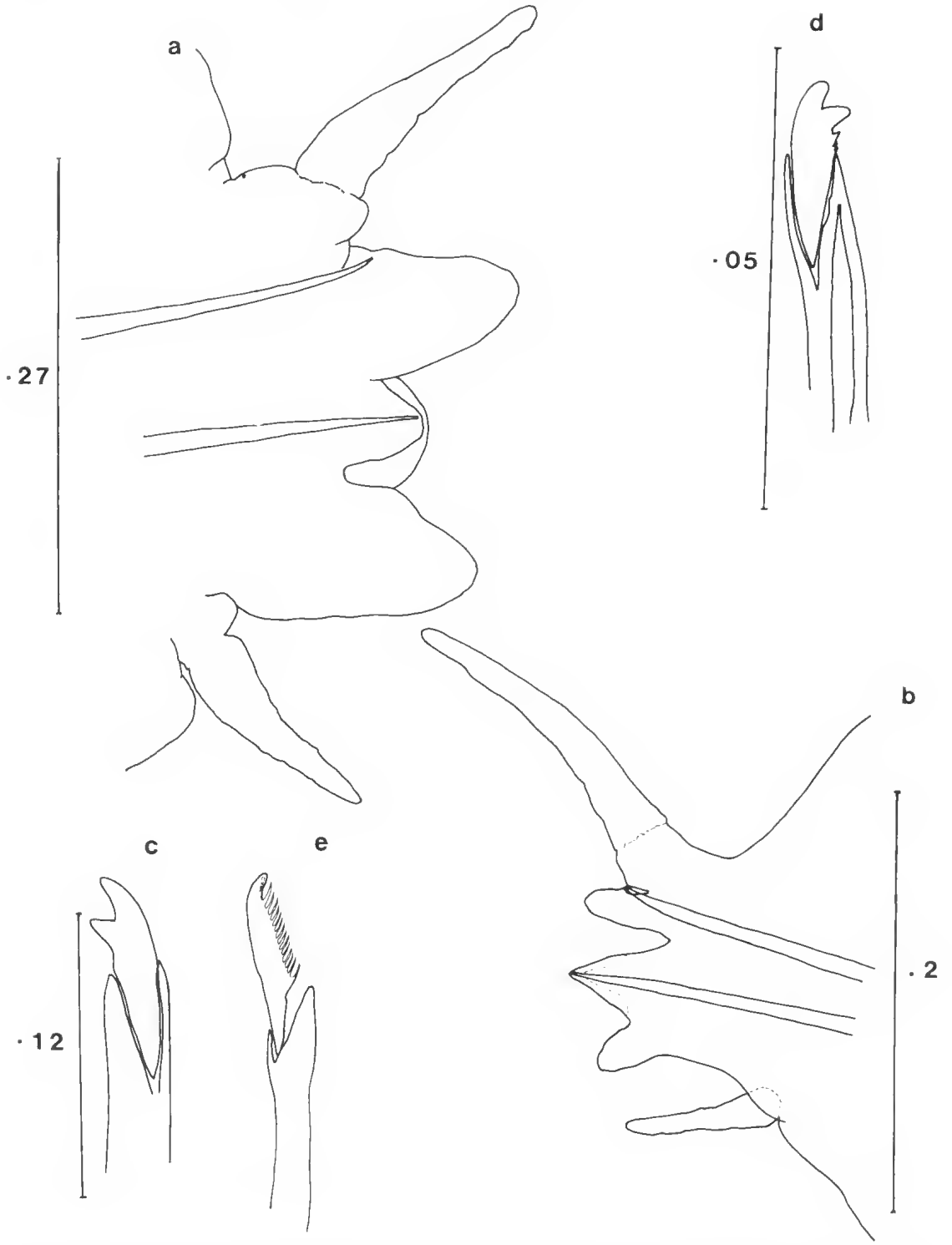


Fig. 16. *Nereis spinigera* n.sp. a. anterior view of 9th parapodium. b. anterior view of 59th parapodium. c. notopodial homogomph falciger, setiger 17. d. notopodial homogomph falciger, setiger 19 (paratype). e. neuropodial heterogomph falciger, setiger 59. Scales in mm.

Size range, 36 setigers, 5.3 mm length, 0.6 mm width to 81 setigers, 23 mm length, 1.1 mm width.

*Description:* Body slender, slightly flattened, dark pink in alcohol with brown pigment in ventral notopodial and neuropodial lobes, especially posteriorly. Posterior segments with conspicuous transverse rows of granulations (exudate from glandular pores). Prostomium length 1.25 times width, anterior margin slightly indented between antennae. Two pairs of eyes, embedded, intense red-brown. Palps tapering rapidly from base, strongly flattened dorsoventrally with palpostyle digitiform, bases of palps adjacent or only narrowly separated. One pair antennae. Four pairs tentacular cirri, distally with faint annulations, longest extending to setiger 4. Pharynx with slender, translucent greenish-brown jaws, basally almost straight, distally sharply curved, with 6 teeth. Paragnaths dark brown cones arranged as follows: I = 0; II = 1–3 large and small cones in oblique line; III = 0; IV = 7 large and small cones in oblique arc; V = 0; VI = 1 small cone; VII–VIII = 6 large cones in single row evenly spaced, largest mid-ventrally. Dorsal cirrus extending slightly past ventral notopodial lobe anteriorly (Fig. 16a), increasing to 4–6 times length of lobe posteriorly (Fig. 16b). Dorsal notopodial lobe absent. Ventral notopodial and neuropodial lobes bluntly conical anteriorly, becoming more pointed posteriorly. Presetal notopodial lobe barely produced as a low ridge on base of ventral notopodial lobe. Dorsal neuropodial lobe with posterior face inflated in anterior setigers, shorter than other lobes anteriorly but elongating in later setigers so that lobes approximately equal or with slight decrease in length ventrally. Ventral cirrus extending two-thirds to three-quarters the way to tip of ventral neuropodial lobe anteriorly and to approximately level with tip posteriorly. Acicula brown-black with pale tips. Notosetae with homogomph spinigers in setigers 1–18, 4 at setiger 9, a single homogomph falciger from setiger 17 (Fig. 16c,d). Early anterior setigers with neurosetae, dorsally, homogomph spinigers above and heterogomph falcigers below; ventrally, heterogomph spinigers above and heterogomph falcigers below. In setigers 9–24 all neuropodial heterogomph falcigers replaced by heterogomph spinigers, e.g. setiger 17 dorsally with 5 homogomph and 2 heterogomph spinigers, ventrally with 5 heterogomph spinigers. Neuropodial heterogomph falcigers present again from setiger 25 and far anterior pattern permanently re-established at setiger 40 with dorsally 2 homogomph spinigers and 1 heterogomph falciger (Fig. 16e), ventrally 3 heterogomph spinigers and 1 heterogomph falciger. Numbers of neurosetae decreasing subsequently. Appendage of homogomph falcigers with a curved terminal tooth and a single, large subterminal tooth, similar in size to terminal tooth or only slightly smaller giving bifid appearance; up to several much smaller teeth sometimes present basally, appendage and end of shaft dark brown, shaft thick. Heterogomph falcigers anteriorly with appendage slender, slightly hooked, finely toothed along most of length, fine tendon below tip, shafts slightly more robust than for spinigers. Appendages becoming slightly more squat and curved along body, little change in shaft thickness. Anal cirri extend over last 6 setigers.

*Comments:* Variation includes prostomium length 1.25–1.5 times width, eyes red-brown to purple-black, palpostyles globose to digitiform. Longest tentacular cirri extending to setiger 3–5. Jaws with 6–7 teeth. Paragnaths I = 0, rarely 1; II = 0–3, frequently with one very large cone and other smaller ones; III = 0; IV = 4–8, occasionally as few as 1 or 0; V = 0; VI = 0 or 1; VII–VIII = 5–7, as few as 2 in very small individuals, occasionally absent. Paragnaths frequently not visible in small specimens at 100 x magnification, or only a few large paragnaths clearly visible in either or both of IV and VIII. Homogomph falcigers first appearing in notosetae at setiger 14–18, transition spinigers to falcigers occurring over 1 to a few setigers. Notopodial homogomph spinigers at about setiger 10 number from 1 to 7, homogomph falcigers at about setiger 40 generally number only 1, occasionally 2. Replacement of neuropodial heterogomph falcigers by heterogomph spinigers at setiger 6–9, occurring over 1–5 setigers. Complete return of heterogomph falcigers at setiger 23–46, occurring over 1–10 setigers. Dorsal neurosetae at about setiger 20 with 0–4 homogomph spinigers above and 1–2 heterogomph spinigers below; ventrally with 3–5 heterogomph spinigers. At about setiger 40, dorsal neurosetae with 0–3 homogomph spinigers above and 1 heterogomph falciger below, ventrally with 2–4 heterogomph above and 1 heterogomph falciger below.

One paratype (18410) ovigerous with few large yolky eggs in coelom. No sign of epitokal modifications.

*Discussion: Nereis spinigera* n.sp. may be distinguished from similar species of *Nereis* using the characteristics given in Table 2.

The name refers to the replacement of heterogomph falcigers in both neuropodial fascicles of anterior segments by heterogomph spinigers.

*Distribution:* South Australia.

*Habitat:* Associated with *Zostera*, algae, coralline algae, as crevice fauna and in amongst clumps of mussels.

**Nereis triangularis** n.sp.
FIG. 17a–f

HOLOTYPE: S.A.—01A (18536), 70 setigers, 24 mm length, 2.7 mm width. PARATYPES: 01A, 1 spec. (AHF POLY 1357). 01A, 1 (BMNH ZB 1982: 31). 01A, 1 (USNM 071537). 01A, 11 (18378). Size ranges from posteriorly incomplete specimen of width 1.5 mm to entire specimen of 72 setigers, length 22 mm, width 2.4 mm.

*Other Material Examined: Nereis zonata.*—419, Spetsbergia Safeh (avn) 30 f, 1864 (SSM 6033). 420, Spetsbergia Shoal point, 15.8.1861 (SSM 6037). 418, Spetsbergia Safeh (avn), 30 f, 1864 (SSM 6034). 421, Spetsbergia, Storfj (orden), Ginevra Bay (SSM 6035). 423, Spetsbergia Waigatsö 30–70 f, 15.8.1861 (SSM 6036) id. Malmgren, part of type series.

*Nereis zonata* var. *persica:* Misiini Bounia—Pérez, 1901, Côtes d'Arabie, St. X4VII, atokes et 1 ♂ epitoke. Collection Français. Nue Caledonie. Mission Gravier—Djibouti 1904, Isles Mugha, Ilnae, 24 ♂ (MNHN) id. Fauvel, not part of type series.

*Description:* Body robust, flattened, colour light brownish-pink in alcohol, brown pigment laterally on prostomium and in notopodial and ventral neuropodial lobes of posterior setigers. Prostomium elongate, almost triangular, length 1.3 times width. Eyes small, round, dark purple-red, lenses not visible. Palps large, stout, ventral length equal to first 3 setigers. One pair antennae, extending slightly past palps. Four pairs tentacular cirri, longest extending to setiger 5 (left, tip lost)–7 (right). Both antennae and tentacular cirri faintly annulated. Pharynx with slender, transparent yellow brown jaws curving more rapidly towards tips, with 9 teeth reduced to low undulations distally. Paragnaths conical, dark brown, arranged as follows: I = 1; II = 11 (right)–15 (left) in triangular patch of 3 oblique arcs; III = 15 in 2 transverse rows; IV = 20 in broad oblique crescent; V = 0; VI = 8 (left)–10 (right) in small oval patch; VII–VIII = about 140 in broad band 6–7 deep tapering laterally, some of the larger cones forming a partly separate single row anteriorly.

Dorsal cirrus 1.3–1.5 times length of dorsal notopodial lobe in anterior setigers (Fig. 17a) elongating to about 3 times length of lobe posteriorly (Fig. 17b). Notopodial and ventral neuropodial lobes elongate and acutely conical in all setigers, dorsal neuropodial lobe blunt. Dorsal and ventral notopodial lobes similar in length. Dorsal and ventral neuropodial lobes slightly shorter and on average similar to each other in length. Notopodium becoming slightly elevated posteriorly. Ventral cirrus reaching one-half to two-thirds way to tip of ventral neuropodial lobe in anterior setigers, about two-thirds way in posterior. Acicula dark brown, hyaline at tips. For numbers and types of setae see Table 15. Heterogomph falcigers (Fig. 17e) anteriorly with shafts slightly thicker than spinigers, becoming much thicker posteriorly; appendages anteriorly slender, coarsely toothed with tip long, rounded, slightly curved and tendon distinct, becoming broader basally in posterior setigers with teeth confined to basal one-third to one-half, tendon varying from distinct-indistinct. Homogomph falcigers appearing from approximately setiger 16–20 (setae damaged in this region), appendages with long, slender terminal tooth curving more sharply towards tip and 1–3 much smaller blunt, stout lateral teeth (Fig. 17 d-f).

Anal cirri extend over last 10 setigers.

*Comments:* Additional variations not described for holotype include prostomium length 1.3–1.5 times width. Eyes pale red. Palp length equal to first 2.5–3 setigers ventrally. Longest tentacular cirri extending to setiger 5–7. Jaws with 8–13 teeth. Paragnaths with I = 0–1, rarely 2; II = 6–15 in 2–3 short oblique lines or disorganised oblique patch; III = 10–30 in 2–3 transverse rows; IV = 15–20 in oblique crescentic patch; V = 0; VI = 6–10 in small oval patch; VII–VIII = about 140–200 in broad, disorganised band of cones of variable size, sometimes with larger cones concentrated anteriorly and then occasionally as a partly separate row. Dorsal cirrus 1.3–2.0 times length of dorsal notopodial lobe anteriorly, 2–4 times length of lobe posteriorly. Dorsal notopodial lobe sometimes slightly

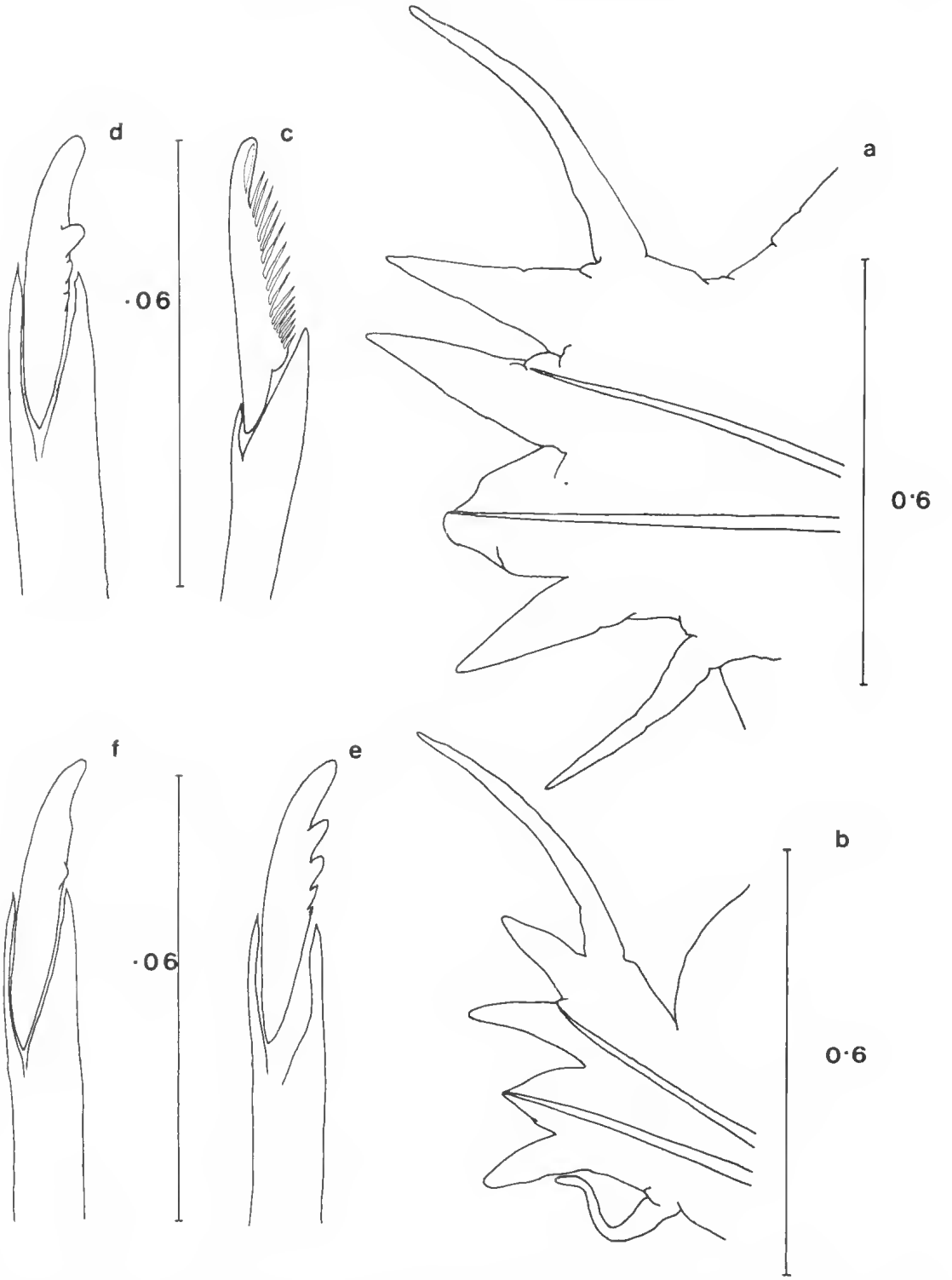


Fig. 17. *Nereis triangularis* n.sp. a. anterior view of 10th parapodium. b. anterior view of 66th parapodium. c. anterior heterogomph neurosubacicular falciger. d-f. notopodial homogomph falciger from setiger 24, 35 and 67 respectively. Scales in mm.

TABLE 15. *Setal counts for* Nereis triangularis *n.sp.*

| | No. of setae | | |
|---|---|---|---|
| | Setiger 10 | Setiger 35 | Setiger 66 |
| *Notosetae* | | | |
| homogomph spinigers | 8 (6–9)* | 1 (0–5) | — |
| homogomph falcigers | — | 3 (1–3) | 1 (1–3) |
| *Neurosetae* | | | |
| (i) Dorsal fascicle | | | |
| above—heterogomph spinigers | 6 (4–8) | 4 (2–5) | 1 (0–5) |
| below—heterogomph falcigers | 5 (1–5) | 3 (2–3) | 0 (0–2) |
| (ii) Ventral fascicle | | | |
| above—heterogomph spinigers | 4 (1–5) | 2 (0–3) | 0 (0–3) |
| below—heterogomph falcigers | 10 (6–11) | 4 (3–6) | 2 (1–3) |

* Numbers in brackets refer to the variation in numbers of setae occurring in 9 paratypes.

shorter than ventral in anterior setigers. Ventral cirrus extending up to one-third of length past tip of ventral neuropodial lobe. Variation in numbers and types of setae shown in Table 15. Homogomph falcigers from setigers 17–26 with the earlier appearances in the smaller specimens. Major teeth of first few homogomph falcigers stout but sharp, frequently with several small, hair-like teeth basally, then teeth becoming blunt in later setigers, often reduced to low rounded bosses in far posterior. Anal cirri extended over last 4–10 setigers.

*Discussion: Nereis triangularis* n.sp. is similar to *Nereis zonata* var. *persica* Fauvel, 1911 and *N. gaikwadi* Day, 1973 in that the notopodial homogomph falcigers have a slender, curved terminal tooth and few smaller, stout lateral teeth while Areas VII–VIII of the pharynx have a continuous, broad band of paragnaths. *Nereis gaikwadi* has a single paragnath in Area V and only one lateral tooth on each homogomph falciger appendage. Material of *N. zonata* var. *persica* identified by Fauvel has homogomph falcigers and parapodia similar to those of *N. triangularis* n.sp. However, the paragnaths in Areas VII–VIII consist of a single, evenly spaced row of large paragnaths widely separated from a broad band of much smaller paragnaths posteriorly (as in the original description by Fauvel). The types for the stem species *N. zonata* Malmgren 1867 differ from *N. triangularis* n.sp. in that the notopodial homogomph falcigers have numerous fine, sharp teeth spaced evenly along the basal half to two-thirds of the appendage, the terminal tooth of the appendage is broad and barely hooked and Area VII–VIII of the pharynx has a narrow band of small cones with an uneven row of very large cones along its anterior margin. We have thus erected *N. triagularis* n.sp.

There are considerable differences between Fauvel's *N. zonata* var. *persica* and Malmgren's *N. zonata* as listed above. We consider these to be separate species and agree with Day (1967) and Read (1980) who gave *N. persica* as a full species without comment.

The name *triangularis* describes the acutely conical parapodial lobes which appear triangular when viewed from most angles.

*Australian Distribution:* South Australia (Port Augusta).

*Habitat:* Muddy intertidal sand flats with many mussels.

*Olganereis* Hartmann-Schröder

Prostomium with paired frontal antennae on biarticulate palps and two pairs of eyes. Peristome achaetous. Four pairs of tentacular cirri. Parapodia of first 2 setigers uniramous, subsequently biramous. Notosetae homogomph spinigers, neurosetae homo- and heterogomph spinigers and heterogomph falcigers. Pharynx with paired jaws and soft papillae on maxillary and oral rings.

Type species: *O. edmondsi* (Hartman).

*Olganereis edmondsi* (Hartman)

*Ceratocephala edmondsi* Hartman, 1954: 23–24, figs 12–17.

*Olganereis edmondsi*.—Hartmann-Schröder, 1977: 147–149, Pl. 21–e, 3a–c.

*Material Examined:* S.A.—01A, 5 spec. (18299), 05A, 14 (18298), 06B, 1 (18297), 12A, 13 (18295), 13A, 11 (18296), 22A, 1 (18292), 22B, 20 (18291), 27C, 3 (18293), 29A, 2 (18290). Vic.—Anderson Inlet, Venus Bay nr Inverloch, intertidal salinity range 3–34‰ (18597).

*Description:* Size range, from 123 setigers, 60 mm length, 1.7 mm width to 168 setigers, 135 mm length, 2.5 mm width; anterior frag-

ments 1.4–3.4 mm in width. Pharynx lacking paragnaths, cirriform papillae present on maxillary and oral rings. First 2 parapodia uniramous, subsequently biramous. Notosetae homogomph spinigers, neurosetae spinigers and falcigers. Additional information: eyes variable in colour and intensity of pigmentation, with distinct lenses. Dorsal notopodial lobe reduced posteriorly, absent in far posterior setigers. Number of noto- and neurosetae reduced considerably posteriorly. Paired anal cirri filiform, equal in length to last 18 or 19 setigers or to as few as last 4 when regenerating.

*Comments:* In some individuals the single papilla on Area I of the pharynx is not visible and the number of papillae on VII–VIII may vary in the range of 8–10, with occasional papillae being bifid. In the original description this number was reported constant at 9 and no mention was made of bifid papillae. Our material also differs from the paratype redescribed by Hartmann-Schröder (1977) by lacking conical postsetal neuropodial lobes. Instead, the lobes are variably produced as low rounded ridges postsetally.

This species was known previously only from the type locality.

*Australian Distribution:* South Australia, Victoria.

*Habitat:* Associated with sand and mud flats, mussel clumps, *Zostera* and encrusting fauna.

*Perinereis* Kinberg

Eversible pharynx with conical and transverse paragnaths on both rings, four pairs of tentacular cirri, parapodia biramous. Notosetae homogomph spinigers, neurosetae homo- and heterogomph spinigers and heterogomph falcigers.

Type species: *P. novae-hollandiae* Kinberg

*Perinereis amblyodonta* (Schmarda)

*Nereilepas amblyodonta* Schmarda, 1861: 106, Pl. XXXI, fig. 245, text figs A–B, a–b, K.

*Perinereis amblyodonta.* — Hartman, 1954: 33. Day & Hutchings, 1979: 108 (for full synonomy).

*Perinereis novae-hollandiae* Kinberg, 1866: 175. Knox, 1951: 221–222, Pl. XLVIII, figs 25–31.

*Material Examined:* S.A.—06C, 5 spec. (18384). 09A, 8 (18382). 09B, 29 (18389). 10A, 4 (18383). 18A, 2 (18391). 29A, 6 (18385). 30A, 2 (18387). 30B, 2 (18386). 30E, 1 (18388). 34A, 1 (18390).

*Description:* Size range, 33 setigers, 5.5 mm length, 0.95 mm width, to 88 setigers, 58 mm length, 4.3 mm width. Pharynx with conical paragnaths except for a transverse bar on VI, arranged as follows: I = 1–3; II, III, IV = variable groups; V = 1 anterior to transverse line of 4; VI = single, transverse, curved bar; VII–VIII = continuous band of 2–3 rows. Anterior parapodia with dorsal neuropodial lobe generally longest, posteriorly with notopodium dorsally elongate and cylindrical except in small specimens. Notosetae homogomph spinigers only, neurosetae dorsally homogomph spinigers and heterogomph falcigers, ventrally heterogomph falcigers only.

*Comments:* Our material agrees well with previous descriptions with the addition that the dorsal elongation of posterior notopodia is less pronounced in smaller individuals.

*Australian Distribution:* Western Australia, Victoria, New South Wales and Queensland.

*Habitat:* Associated with encrusting algal communities and mussel clumps.

*Perinereis nuntia* (Savigny)

*Lycoris nuntia* Savigny, 1822: 33.

*Perinereis nuntia.*—Fauvel, 1932: 108–111.

*Perinereis vallata.*—Hartman, 1954: 35. *Non* Grube.

*Material Examined:* S.A.—05A, 4 spec. (18331). 06A, 7 (18332). 10A, 12 (18330). 12C, 1 (18329). 28A, 3 (18328). 29A, 1 (18327). Garden Island, Port Adelaide, mangroves, 2 (18469–70) coll. Butler.

*Perinereis nuntia* var. *brevicirrus.* — Krusadai Island, Gulf of Manaar, 9.9.1925 (MNHN); Tehé-Fou China 1931, (MNHN); Ouen Island, New Caledonia, 1928 (MNHN), id. Fauvel.

*Perinereis nuntia* var. *vallata.*—Chaupathi, Malabar, Bombay (MNHN) 15.2.1925, id. Fauvel.

*Perinereis nuntia vallata.*—Port Willunga, S.A., 1 spec. (AHF N5754) coll. S. J. Edmonds, id. Hartman.

*Description:* Size range 51 setigers, 12 mm length, 0.8 mm width to 106 setigers, 68 mm length, 3.8 mm in width. Colour in alcohol dark pink, brown pigment granules on anterolateral margins of prostomium, dorsal and lateral margins of palps and in transverse lines parallel to the anterior margin of each setiger. Notopodial and ventral neuropodial lobes dark brown. Intensity of pigmentation variable. Prostomium about as long as wide with 2 pairs of deeply embedded eyes, palps robust. Four pairs of tentacular cirri, longest extending to setiger 4–9, other pairs decreasing successively by one-half to two-thirds, with the 2 shortest pairs equal in length.

Pharynx with paragnaths arranged as follows: I = 0–2 cones; II = 6–12, occasionally

as few as 2 cones in triangular patch; III = 7–30 cones arranged in transverse oval or rectangular patch, often with 1–3 separated on either side of main patch; IV = 20–34 cones in crescent; V = 1–2 cones arranged longitudinally at the same level or slightly posterior to rows of bars in VI; VI = 7–15, rarely as few as 5 short, low to pointed bars arranged in a transverse arc; VII–VIII = 2 irregular rows of large and slightly smaller cones tapering to 1 row at sides.

Notopodial and ventral neuropodial lobes bluntly conical anteriorly, posteriorly become more acutely conical but still blunt. Anteriorly notopodial and dorsal neuropodial lobes approximately equal, ventral neuropodial lobe shorter. Posteriorly dorsal notopodial lobe longer than ventral, both longer than neuropodial lobes. Notopodium dorsally inflated and somewhat elevated posteriorly.

Dorsal cirrus variable in length, from two-thirds to one and a half times the length of dorsal notopodial lobe anteriorly, increasing in far posterior to 2–3 times length of the lobe. Ventral cirrus anteriorly extending one-third to half the way to the tip of ventral neuropodial lobe, posteriorly becoming slightly shorter, extending to base of the lobe.

*Comments:* Savigny (1822) described *Perinereis nuntia* and subsequently Grube (1857) established *P. nuntia* var. *brevicirris* and var. *vallata*, based on variations in the paragnath count. In a major review of this species complex Fauvel (1932) described two more varieties of this species and a third in 1932. Fauvel distinguished the five varieties from the stem species on the presence or absence of paragnaths on V, their arrangement if present, the type of paragnaths on VI and the relative lengths of the tentacular cirri. We have examined Fauvel's material of *brevicirris* and *vallata* and confirm the distinguishing characteristics. However Fauvel (1932, p. 109) states "many specimens are intermediate, and so gradual are the transitions that they cannot be assigned definitely to any variety". In contrast Knox (1951), working on New Zealand material, found consistent differences between *P. nuntia* var. *brevicirris* and var. *vallata*. *Perinereis* v. *vallata* had a single cone (he does not indicate position) on group V of the pharynx whereas *brevicirrus* had 3 cones forming a triangle. There were also differences in the relative lengths of the dorsal and ventral cirri. Hartman (1954) working on Australian nereids raised these two varieties to full species with no comment. Our material is indistinguishable from Hartman's (1954) specimen but cannot be clearly identified with the two varieties or species as described by Hartman. The material does not agree with the other varieties described by Fauvel so we have given a full species description and referred all material back to the stem species *P. nuntia*. We believe that a far more detailed investigation of this species is necessary to ascertain whether we are dealing with a highly variable species or a complex with consistent sub-units possibly warranting specific status. Paik (1975) working on material from Korea found no consistency in the number and arrangement of paragnaths and was able to separate the material into 19 arbitrary groups. Other morphological features did not vary and Paik suggested that the two varieties of *P. nuntia vallata* and *brevicirris*, are not valid and synonymised them with *P. nuntia*.

Some of our material (18331) was sexually mature although no epitokous modifications were apparent.

*Australian Distribution:* Western Australia, South Australia, Victoria, New South Wales, Queensland.

*Habitat:* Associated with mussel clumps, algae and *Zostera*.

### *Perinereis variodentata* Augener

*Perinereis variodentata* Augener, 1913: 179–182, Pl. 3, fig. 50, text figs 19a–c. Kott, 1951: 112–113, text figs 6a–d. Hartman, 1954: 35.

*Material Examined:* S.A.—08A, 1 spec. (18333), 09B, 16 (18334), 21A, 20 (18342), 22C, 1 (18341), 23A, 4 (18335), 30A, 41 (18336), 30B, 4 (18336), 30C, 51 (18336), 30D, 87 (18337), 32A, 1 (18340).

*Description:* Size range 35 setigers, 4.9 mm length, 0.65 mm width, to 69 setigers, 48 mm length, 4.3 mm width. Pharynx with conical paragnaths on all Areas except VI with transverse bars, arranged as follows: I = 7–25, occasionally as few as 1–5 in small specimens, in triangular or diamond patch; II = 7–10 (as few as 3) in 2 oblique parallel rows; III = 1–6 in small patch; IV = 8–21 (as few as 6) in oblique band of 2–3 irregular rows; V = generally 4–6 (extremes 2–15) irregular patch sometimes extending onto VI; VI = 2 curved bars in transverse line; VII–VIII generally 66–68 (extremes 34–118) large and small cones in 2–3 irregular rows laterally, 5–6 ventrally.

Parapodial lobes equal in length or decreasing ventrally. Notopodium becoming dorsally inflated and elongate in posterior parapodia of large individuals.

*Comments:* Our material exhibits slightly more variation in paragnath counts than Hartman (1954) indicated, although even in her description she recorded considerable variation. This increased variation may be attributable to a wider distribution of material available to us in comparison to Hartman's single locality.

*Australian Distribution:* Western Australia, South Australia and Tasmania.

*Habitat:* Associated with encrusting algae and seagrasses.

### *Platynereis* Kinberg

Pharynx eversible with paragnaths on both oral and maxillary rings, including cones and pectinate bars. Four pairs of tentacular cirri, parapodia biramous. Notosetae homogomph spinigers and falcigers, the latter sometimes fused to form simple falcigers; neurosetae include homo- and heterogomph spinigers and heterogomph falcigers.

Type species: *P. magalhaensis* Kinberg

#### *Platynereis dumerilii antipoda* Hartman

*Platynereis dumerilii antipoda* Hartman, 1954: 35–36, figs 33–37; Hutchings & Rainer, 1979: 757–758; Hartman-Schröder, 1980: 60.

*Material Examined:* S.A.—03C, 9 spec. (18321). 08A, 1 (18318). 15A, 1 (18322). 16B, 1 (18319). 17A, 1 (18320). 21A, 3 (18326). 22B, 4 (18314). 23A, 17 (18325). 30D, 1 early ♀ epitoke (18381). 24A, 4 (18315). 30D, 1 (18323). 32A, 8 (18324). 33A, 1 (18316). 34A, 1 (18317). Tas.—Fancy Point, Bruny Island, in algae at 3.6 m, coll. Edgar 9.6.78.

*Description:* Size range 33 setigers, 5.1 mm length, 0.75 mm width to 76 setiger, 25 mm length, 2.4 mm width. Eversible pharynx with paragnaths as pectinate bars arranged as follows: I = 0; II = 0; III = small scattered groups in about 2–3 approximately parallel transverse rows; IV = 3–4 rows forming a triangular patch; V = 0; VI = small group of up to 3 short, concentric, crescentic rows; VII–VIII = up to 5 evenly spaced patches similar to those in VI.

Notopodial and ventral neuropodial lobes conical except at about setiger 4–10 where globose. Dorsal neuropodial lobe with digitiform postsetal lobe in first 3–4 setigers, variably reduced more posteriorly to small conical process. Notopodium becoming more dorsally elongated and inflated posteriorly.

Heavily gravid female (18381) subepitokous. Setigers 1–4 with bases of dorsal and ventral cirri expanded. Partly emergent natatory setae from setiger 19 in addition to normal complement of atokous setae. Notopodium with additional digitiform lobe medial to dorsal cirrus from setiger 20, dorsal notopodial lobe compressed, ventral and presetal notopodial lobes flattened, blade-like from setiger 19. Neuropodium with postsetal lobe foliaceous, digitiform lobes dorsal and ventral to the base of ventral cirrus from setiger 19. Intermediate stages in both noto- and neuropodium in the 2–3 setigers preceding setiger 19.

*Comments:* Our material exhibited considerable variability in the paragnaths on IV. Hartman (1954) describes several rows of pectinae on IV whereas we have found triangular patches consisting of 3 or 4 rows (occasionally 2) of pectinae with small irregular pectinae at the apices of the triangle. These rows of pectinae may be continuous or broken, occasionally reduced to a few short scattered fragments in small individuals. Pectinae may also be fewer on III (2–3) than Hartman reported and each group on VI–VIII may be condensed into a single broad row.

Variation also occurs in the tips of the appendages of the notopodial falcigers which range from faintly to boldly notched.

*Australian Distribution:* Western Australia (Port Hedland, Port Samson, Exmouth, Tantabiddy Creek, Kurbarri, Geraldton, Cervantes). South Australia, Tasmania, New South Wales (Careel Bay) and Queensland.

*Habitat:* Seagrass beds, associated with algae and encrusting faunas.

### *Pseudonereis* Kinberg

Pharynx eversible with paragnaths on both rings, including cones, transverse smooth bars and pectinate bars. Four pairs of tentacular cirri; parapodia biramous. Notosetae include homogomph spinigers and falcigers; neurosetae homo- and heterogomph spinigers and heterogomph falcigers.

Type species: *P. gallapagensis* Kinberg.

#### *Pseudonereis anomala* Gravier

*Pseudonereis anomala* Gravier, 1901: 191–197, text figs 194–200; 1900: Pl. 12, figs 50–52; Fauvel, 1922: 494.

*Nereis nichollsi* Kott, 1951: 93–95, text figs 2a–k.

*Material Examined:* S.A.—27A, 1 spec. (18313). 30A, 48 (18311). 30C, 6 (18312). 30D, 110

(18310). Upper Spencer Gulf (5967) coll. Shepherd. North Arm, Port Adelaide, mangroves (6004) coll. Butler.

*Nereis nichollsi*.—W.A.—Rottnest Island, Point Peron, Abrolhos, HOLOTYPE (7036), many PARATYPES (7037).

*Description:* Size range 35 setigers, 6.1 mm length, 0.95 mm width to 66 setigers, 42 mm length, 4.8 mm width. Palps large, stout, basal part strongly laterally compressed, equal in length to first 3–3.5 setigers. Pharynx with paragnaths in II, III and IV flattened and sharply triangular, generally forming regular comb-like rows but sometimes irregular. Paragnaths typically arranged as follows: I = 1 large cone; II = 17–32 in oblique rectangular group of 4–6 short transverse rows; III = 37–82 in 3–6 transverse arcs; IV = 32–68 in rectangular group of 4–5 rows, often additional irregular groups of normal cones towards jaws; V = 0; VI = 5–9 cones in single transverse arc, sometimes with an additional isolated cone; VII–VIII = 14–22 in 2 alternating rows, anterior with very large cones, posterior with small cones.

Anteriorly notosetae homogomph spinigers, dorsal neurosetae homogomph spinigers and heterogomph falcigers, ventral neurosetae heterogomph falcigers. Posteriorly notosetae homogomph spinigers and falcigers, dorsal neurosetae homogomph spinigers and heterogomph falcigers, ventral neurosetae heterogomph spinigers and falcigers. Posterior notopodia undergoing considerable dorsolateral elongation in larger specimens. Dorsal notopodial lobe frequently reducing to become absent posteriorly in small specimens.

*Comments:* Our material is indistinguishable from Kott's, although Kott's description omits the homogomph spinigers in the dorsal neurosetae of middle and posterior setigers. The material agrees closely with Gravier's (1901) description with the exception that Gravier does not describe the neurosetae of middle and posterior setigers. Paragnath numbers are more variable in our material than previously described and may be greatly reduced in very small specimens to as few as I = 0; II = 12; III = 10; IV = 16; VI = 4; VII–VIII = 11.

This species has not been recorded previously from South Australia.

*Australian Distribution:* Western Australia, South Australia and New South Wales.

*Habitat:* Associated with encrusting fauna, coralline algae and algal holdfasts.

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